

Appeal No. 16-1166

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

ICON HEALTH & FITNESS, INC., a Delaware corporation,

Plaintiff-Appellant,

v.

**GARMIN INTERNATIONAL, INC., a Kansas corporation, GARMIN
USA, INC., a Kansas corporation,**

Defendants-Appellees.

APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE
DISTRICT OF UTAH IN 1:11-CV-00166-RJS, JUDGE ROBERT J. SHELBY

**COMBINED BRIEF AND APPENDIX OF APPELLANT
ICON HEALTH & FITNESS, INC.**

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February 3, 2016

CERTIFICATE OF INTEREST

Counsel for the appellant Icon Health & Fitness, Inc. certifies the following:

1. The full name of every party or amicus represented by me is:

Icon Health & Fitness, Inc.

2. The name of the real party in interest represented by me is:

Icon Health & Fitness, Inc.

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

HF Holdings, Inc. is the parent company.

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are:

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STATEMENT OF RELATED CASES

There have been no other appeals from the civil action from which this appeal is taken. There is, however, an appeal pending before this Court that will directly affect the outcome of the present appeal: Case No. 15-1891, *Icon Health & Fitness, Inc. v. Polar Electro Oy and Polar Electro Inc.* Per the Court's "note to file" in the docket for the present appeal, "[t]hese cases shall be considered companion cases and assigned to the same merits panel for oral argument." (Docket Entry No. 2.)

JURISDICTIONAL STATEMENT

This is an appeal from a final judgment entered by the United States District Court for the District of Utah in a patent case styled *Icon Health & Fitness, Inc. v. Garmin Int'l and Garmin USA*, Case No. 1:11-CV-00166-RJS (D. Utah). (A13.) Jurisdiction therefore arises under 28 U.S.C. § 1295(a)(1).

STATEMENT OF THE ISSUES

Whether the judgment of the district court that the claims of plaintiff-appellant Icon Health & Fitness, Inc. ("Icon") against defendants-appellees Garmin International, Inc. and Garmin USA, Inc. (collectively, "Garmin") for infringement of United States Patent No. 6,921,351 ("the '351 patent")

are barred by the doctrine of issue preclusion should be vacated as premised upon an underlying invalidity judgment that has been reversed.

STATEMENT OF THE CASE

In the proceedings before the district court, Icon's First Amended Complaint alleged infringement of four United States patents: U.S. Patent No. 6,701,271 ("the '271 patent"); U.S. Patent No. 7,789,800 ("the '800 patent"); U.S. Patent No. 6,626,799 ("the '799 patent"); and the '351 patent. (A11.) Icon and Garmin stipulated to dismissal without prejudice of the claims involving the '271 and '800 patents, once those patents became the subject of reexamination proceedings. (*Id.*) Garmin moved for judgment on the pleadings on the remaining two patents. (A2, A6.)

The district court granted Garmin's motion in a Memorandum Decision and Order dated September 29, 2015 (A1-A12), finding the asserted claims of the '799 patent invalid as being drawn to patent ineligible subject matter, and dismissing the case involving the '351 patent as barred by the doctrine of issue preclusion. (A2, A10.) The latter holding was based on issue preclusion arising from the decision at the heart of the co-pending appeal, *Icon Health & Fitness, Inc. v. Polar Electro Oy and Polar Electro Inc.*, Case No 15-1891 ("the *Polar* appeal"), in which a different judge

in the same district entered judgment that the claims of the '351 patent were invalid as indefinite. (A2-A6.) The final judgment subsequently entered by the *Garmin* district court (A13) is best characterized as two judgments, which will be referred to herein as the *Garmin* '351 Judgment and the *Garmin* '799 Judgment. The earlier judgment upon which the *Garmin* '351 Judgment is predicated will be referred to as the *Polar* Judgment.

SUMMARY OF THE ARGUMENT

Icon does not appeal the *Garmin* '799 Judgment. The purpose of the present appeal, rather, is to secure reversal of the *Garmin* '351 Judgment in the event the Court rules in Icon's favor in the co-pending *Polar* appeal involving the '351 patent, and reverses the underlying *Polar* Judgment. The *Garmin* '351 Judgment is predicated on the *Polar* Judgment. If the predicate *Polar* Judgment is reversed, the basis for the *Garmin* '351 Judgment evaporates. In that circumstance, the *Garmin* '351 Judgment must likewise be reversed and the case remanded for further proceedings.

ARGUMENT

I. Standard of Review

This Court applies the law of the regional circuit, in this case the Tenth Circuit, to “the general procedural question of whether issue preclusion applies.” *Soverain Software LLC v. Victoria's Secret Direct Brand Mgmt., LLC*, 778 F.3d 1311, 1314 (Fed. Cir. 2015) (citation omitted). In the Tenth Circuit, a district court’s application of the doctrine of issue preclusion (also called collateral estoppel) is reviewed de novo. *Salguero v. City of Clovis*, 366 F.3d 1168, 1172 (10th Cir. 2004). As to “questions involving substantive issues of patent law, issues of issue preclusion that implicate substantive patent law issues, or issues of issue preclusion that implicate the scope of our own previous decisions,” this Court applies its own precedent. *Soverain*, 778 F.3d at 1314 (citation omitted).

II. If the Polar Judgment is reversed, then the Garmin ’351 Judgment at issue in the present appeal should likewise be reversed.

The test in the Tenth Circuit for issue preclusion has four parts:

- (1) the issue previously decided is identical with the one presented in the action in question,
- (2) the prior action has been finally adjudicated on the merits,
- (3) the party against whom the doctrine is invoked was a party, or in privity with a party, to the prior adjudication, and

(4) the party against whom the doctrine is raised had a full and fair opportunity to litigate the issue in the prior action.

Dodge v. Cotter Corp., 203 F.3d 1190, 1198 (10th Cir. 2000). The Federal Circuit's test is stated in slightly different terms, adding the requirement that "the determination of the issues was necessary to the resulting judgment" in the earlier case. *Levi Strauss & Co. v. Abercrombie & Fitch Trading Co.*, 719 F.3d 1367, 1371 (Fed. Cir. 2013). Both the Federal Circuit and the Tenth Circuit recognize, however, that a reversed judgment cannot support preclusion.

In *In re Hedged Investments Assocs.*, 48 F.3d 470 (10th Cir. 1995), the Tenth Circuit rejected an argument that the bankruptcy court should have applied issue preclusion, observing that the allegedly preclusive earlier judgment had been reversed. *Id.* at 472-473. "As such, there is no longer any 'final decision on the merits' as required to apply the doctrine of collateral estoppel [i.e., issue preclusion]." *Id.* at 473. Thus, even if the lower court had erred in refusing to apply issue preclusion, the subsequent reversal of the allegedly preclusive judgment rendered the error moot. *Id.* at 472-473.

The result is the same in the Federal Circuit, even with the added requirement of the determination of the issue being necessary to the resulting judgment. “Dating back at least to *Butler v. Eaton*, 141 U.S. 240, 242–44, 11 S.Ct. 985, 35 L.Ed. 713 (1891), a bedrock principle of preclusion law has been that a reversed judgment cannot support preclusion; indeed, ‘a second judgment based upon the preclusive effects of the first judgment should not stand if the first judgment is reversed.’” *Levi Strauss*, 719 F.3d at 1372 (quoting 18A Charles A. Wright, *et al.*, Federal Practice and Procedure § 4433 (2d ed. 2002)).¹ In *Levi Strauss*, a 2009 judgment regarding trademark dilution had been reversed on appeal. *Levi Strauss*, 719 F.3d at 1369-1370. This led the Court to reason that “[t]he 2009 district-court findings are not necessary to a resulting judgment, as required for issue preclusion, when, as is true in this case, the only judgment they supported has been reversed.” *Id.* at 1372.

The *Polar* Judgment is pending appeal, but the district court determined that fact alone was insufficient to defeat its preclusive effect.

¹ Notably, the *Levi Strauss* court cites the Tenth Circuit’s *In re Hedged-Investments* decision as among the several cases cited to show the widespread acceptance of the above-stated principle. *Levi Strauss*, 719 F.3d at 1372.

(A5-A6.) The district court noted that a number of circuits have adopted the view that a final judgment is preclusive, even if it is one pending appeal, i.e., one that may very well be reversed. (A5.) The district court also noted, however, that the Tenth Circuit has yet to directly address the issue of the preclusive effect of a judgment that has been appealed. (*Id.* at n. 11.)

Whether the district court was correct in its holding is ultimately irrelevant, however, given the “bedrock principle of preclusion law ... that a reversed judgment cannot support preclusion.” *Levi Strauss*, 719 F.3d at 1372. Per the Court’s “note to file” in the docket for the present appeal, this case and the *Polar* appeal “shall be considered companion cases and assigned to the same merits panel for oral argument.” (Docket Entry No. 2.) Thus there are no issues that could arise from discordant timing, or having the appeals pending before separate circuit courts, or even before separate panels. The outcome of the *Polar* appeal will dictate the outcome of the present appeal, and the same panel will decide both cases.

The Federal Practice and Procedure treatise cited by the *Levi Strauss* court notes that “[s]ubstantial difficulties result from the rule that a final trial-court judgment operates as *res judicata* while an appeal is pending.” 18A Charles A. Wright, *et al.*, Federal Practice and Procedure § 4433 (2d ed.

2002) (citing cases at n. 18). The danger facing a party whose case is dismissed on the basis of preclusion arising from a case pending appeal is that “[i]n some cases, litigants and the courts have collaborated so ineptly that the second judgment has become conclusive even though it rested solely on a judgment that was later reversed.” *Id.* The treatise notes several ways to go about avoiding this result, including “by delaying further proceedings in the second action pending conclusion of the appeal in the first action, *by a protective appeal in the second action that is held open pending determination of the appeal in the first action*, or by direct action to vacate the second judgment.” *Id.* (emphasis added) (citing cases at n. 20).

In this case, Icon has opted for the “protective appeal,” although there will be no need to hold it open since both appeals will be decided by the same panel, presumably at the same time.

CONCLUSION

Icon respectfully submits that if the *Polar* Judgment is reversed then the *Garmin* ’351 Judgment should likewise be reversed, and that this case

should then be remanded for further proceedings on Icon's claim for infringement of the '351 patent against Garmin.

Respectfully submitted,

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DATED: February 3, 2016

APPENDIX

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**IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF UTAH
NORTHERN DIVISION**

ICON HEALTH & FITNESS, INC.,

Plaintiff,

v.

GARMIN INTERNATIONAL and GARMIN
USA,

Defendants.

**MEMORANDUM DECISION
AND ORDER**

Case No. 1:11-cv-166-RJS

Judge Robert J. Shelby

Icon Health & Fitness, Inc. alleges that Garmin International and Garmin USA infringed U.S. Patent No. 6,921,351 entitled “Method and Apparatus for Remote Interactive Exercise and Health Equipment” (the ’351 Patent) and U.S. Patent No. 6,626,799 entitled “Systems and Methods for Providing an Improved Exercise Device with Motivational Programming” (the ’799 Patent). There are a number of motions and issues before the court. The court analyzes each in turn and concludes that Garmin is entitled to judgment on the pleadings on Icon’s causes of action for infringement of the ’351 Patent and the ’799 Patent.

DISCUSSION

I. THE '351 PATENT

A. Background

Icon alleges that Garmin infringed the '351 patent. The '351 Patent covers an exercise system comprised of a local system (an exercise apparatus and a local computer) and a remote system (a remote computer and a transmission medium, such as the Internet) that exchange data related to the use of the exercise apparatus.

In a separate pending lawsuit in this district, Icon sued Polar Electro Oy and Polar Electro Inc. for infringement of the '351 patent.¹ On May 18, 2015, the *Polar* court issued a Memorandum Decision and Order in which it found the '351 patent invalid for indefiniteness and dismissed Icon's related infringement cause of action.² On July 8, 2015, the *Polar* court certified its May 18 Order pursuant to Federal Rule of Civil Procedure 54(b) and entered final judgment on Icon's cause of action for infringement of the '351 patent.

Garmin now moves for judgment on the pleadings, arguing that the *Polar* court's judgment precludes Icon's infringement cause of action in this case. For the reasons stated below, the court agrees and concludes that issue preclusion applies.

B. Rule 12(c)

A Rule 12(c) motion for judgment on the pleadings is evaluated in the same manner as a Rule 12(b)(6) motion to dismiss for failure to state a claim.³ A motion for judgment on the pleadings should be granted when, accepting the well-pleaded allegations of the complaint as

¹ *Icon Health & Fitness, Inc. v. Polar Electro Oy*, Case No. 1:11-CV-00167-BSJ.

² 2015 WL 2376056, at *12 (D. Utah May 18, 2015).

³ See *Atlantic Richfield Co. v. Farm Credit Bank*, 226 F.3d 1138, 1160 (10th Cir. 2000).

true, “it appears that the plaintiff can prove no set of facts in support of the claims that would entitle the plaintiff to relief.”⁴

C. Issue Preclusion

Issue preclusion prevents a party from “relitigating an issue once it has suffered an adverse determination on the issue, even if the issue arises when the party is pursuing or defending against a different claim.”⁵ Garmin points to the issue-preclusion elements under Utah law, but issue preclusion is a procedural concept governed by federal law.⁶ The Federal Circuit applies the issue-preclusion elements from the regional circuit.⁷ In the Tenth Circuit, issue preclusion applies when

(1) the issue previously decided is identical with the one presented in the action in question, (2) the prior action has been finally adjudicated on the merits, (3) the party against whom the doctrine is invoked was a party, or in privity with a party, to the prior adjudication, and (4) the party against whom the doctrine is raised had a full and fair opportunity to litigate the issue in the prior action.⁸

It is undisputed that Icon was a party in *Polar*, meaning the third element is not at issue. The court examines the other three elements in turn.

⁴ *Id.*; see also Fed. R. Civ. P. 12(b)(6).

⁵ *Park Lake Res. Ltd. Liab. v. U.S. Dep’t of Agric.*, 378 F.3d 1132, 1136 (10th Cir. 2004).

⁶ See, e.g., *Abbott Labs. v. Andrx Pharm., Inc.*, 473 F.3d 1196, 1202 (Fed. Cir. 2007); *In re Klippel*, 183 B.R. 252, 258 (Bankr. D. Kan. 1995) (citing *Parklane Hosiery Co. v. Shore*, 439 U.S. 322 (1979)).

⁷ See, e.g., *Ohio Willow Wood Co. v. Alps South, LLC*, 735 F.3d 1333, 1342 (Fed. Cir. 2013); *Abbott Labs.*, 473 F.3d at 1202; *Pharmacia & Upjohn Co. v. Mylan Pharm., Inc.*, 170 F.3d 1373, 1381 (Fed. Cir. 1999); *CardSoft, LLC v. First Data Corp.*, No. 2:13-CV-290-JRG-RSP, 2014 WL 2879695, at *3 (E.D. Tex. June 24, 2014); *Tyco Healthcare Grp. LP v. Applied Med. Res. Corp.*, No. 9:09-CV-176, 2013 WL 4757948, at *2 (E.D. Tex. Sept. 4, 2013).

⁸ *Park Lake Res.*, 378 F.3d at 1136 (quoting *Dodge v. Cotter Corp.*, 203 F.3d 1190, 1198 (10th Cir. 2000)); *Murdock v. Ute Indian Tribe of Uintah & Ouray Reservation*, 975 F.2d 683, 687 (10th Cir. 1992); see also *Martinez v. Hooker*, 601 F. App’x 644, 647 (10th Cir. 2015) (unpublished). The court notes that the Utah elements for issue preclusion are similar to the Tenth Circuit elements:

(i) the party against whom issue preclusion is asserted must have been a party to or in privity with a party to the prior adjudication; (ii) the issue decided in the prior adjudication must be identical to the one presented in the instant action; (iii) the issue in the first action must have been completely, fully, and fairly litigated; and (iv) the first suit must have resulted in a final judgment on the merits.

Oman v. Davis Sch. Dist., 194 P.3d 956, 965 (Utah 2008).

1. Identical Issue

The validity of the '351 Patent was at issue in both *Polar* and this lawsuit. In particular, both Polar and Garmin contended during claim construction in their respective cases that the terms “in-band communication” and “out-of-band communication” were indefinite under 35 U.S.C. §112. Icon maintains that the issue of indefiniteness is not before the court. However, Garmin raised the indefiniteness defense in its Answer and during the hearing on claim construction, and the court expressed concern that Icon’s proposed constructions would render the claims indefinite. Although Polar and Garmin did not present identical arguments and theories regarding invalidity, both courts heard and addressed the argument that the '351 Patent is invalid. Further, the *Polar* court ultimately invalidated the '351 Patent as indefinite, holding that the terms “in-band,” “out-of-band,” and “relationship” were ambiguous and incapable of constructions.

The court concludes that there were identical issues presented for purposes of issue preclusion. Issue preclusion prevents parties from relitigating settled matters. Here, a federal court has invalidated the '351 Patent. Further litigation on the issue of invalidity is therefore unnecessary.

2. Final Adjudication on the Merits

In addition to infringement of the '351 Patent, Icon also brought in *Polar* causes of action for infringement of the '800 Patent and the '271 Patent. In May 2013, the parties stipulated to stay consideration of those causes of action pending reexamination. Icon contends that the *Polar* lawsuit has not reached a final adjudication because those causes of action are still stayed, meaning the *Polar* court has not ruled on them.

In July 2015, the *Polar* court entered final judgment pursuant to Federal Rule of Civil Procedure 54(b) on Icon’s cause of action for infringement of the ’351 patent. Rule 54(b) allows a court to enter final judgment “as to one or more, but fewer than all, claims or parties only if the court expressly determines that there is no just reason for delay.”⁹ The *Polar* court concluded that the cause of action for infringement of the ’351 patent is “distinct and separable from the remaining claims in this case” and on that basis entered final judgment on the merits in favor of Polar.¹⁰ In view of this, the court concludes that the cause of action for infringement of the ’351 Patent reached a final adjudication that is unaffected by the stayed causes of action relating to other parties.

3. Full and Fair Opportunity to Litigate the Issue

Icon asserts that it has not had a full and fair opportunity to litigate the issue because it has not exhausted its appeal of the *Polar* court’s invalidity ruling. But Icon cites no Tenth Circuit precedent establishing that a district court’s final judgment lacks preclusive effect pending an appeal.¹¹ And ample case law from other federal courts stands for the opposite conclusion—that the final judgment retains preclusive effect pending an appeal.¹² In the event the Federal Circuit reverses the *Polar* court’s judgment regarding the ’351 patent, Icon may

⁹ Fed. R. Civ. P. 54(b).

¹⁰ Case No. 1:11-CV-00167-BSJ (Dkt. 117).

¹¹ Icon cites *In re Hedged-Investments Associates, Inc.*, 48 F.3d 470, 473 (10th Cir. 1995), in which the Tenth Circuit noted problems that would stem from issue preclusion when the predicate judgment is subsequently vacated. The Tenth Circuit did not directly address the question whether a district court’s final judgment has a preclusive effect pending an appeal.

¹² See, e.g., *Pharmacia & Upjohn Co.*, 170 F.3d at 1381; *Warwick Corp. v. Maryland Dep’t of Transp.*, 573 F. Supp. 1011, 1014 (D. Md. 1983) (quoting 18 CHARLES ALAN WRIGHT ET AL., FEDERAL PRACTICE AND PROCEDURE § 4433, at 308 (1981)); see also *Phelps v. Hamilton*, 122 F.3d 1309, 1318 (10th Cir. 1997) (applying Kansas law, but acknowledging the “now-majority view” that the pendency of an appeal does not “vitiate the res judicata effect of a judgment”); *SSIH Equipment S.A. v. United States Int’l Trade Comm’n*, 718 F.2d 365, 370 (Fed. Cir. 1983).

certainly seek appropriate relief from this court.¹³ Until then, however, the *Polar* court's ruling precludes Icon's cause of action related to the '351 patent.

II. THE '799 PATENT

A. Background

The '799 patent relates to exercise equipment that contains technology designed to motivate users to exercise more regularly. Icon asserts that Garmin infringed claims 1 and 2 of the '799 patent.¹⁴ Claim 1 states:

A data signal having data encoded thereon transmitted over a communication channel, comprising:

- (a) a first data field defining a first operating parameter value for one of one or more operating parameters of an exercise device;
- (b) a second data field defining a second operating parameter value for another of said one or more operating parameters of the exercise device; and
- (c) a third data field defining a checksum of said first byte of data and said second byte of data, said checksum configured to be used by the exercise device for error detection of the first operating parameter value and the second operating parameter value.

Claim 2 states:

A data signal as recited in claim 1, wherein at least one of the first operating parameter value and the second operating parameter value indicates a speed of the exercise device.

Garmin moves under Rule 12(c) for judgment on the pleadings, contending that the data signal covered in claims 1 and 2 is not directed at statutory subject matter under 35 U.S.C. § 101.

¹³ See *Levi Strauss & Co. v. Abercrombie & Fitch Trading Co.*, 719 F.3d 1367, 1372 (Fed. Cir. 2013).

¹⁴ Garmin's Preliminary Invalidity Contentions state that Icon asserts claims 1 and 2 of the '799 patent. (Dkt. 119, exh. A.) Further, the Markman briefing and the briefing on Garmin's Rule 12(c) Motion focus on claims 1 and 2. (Dkt. 74.) Icon's Amended Complaint does not state which claims it is asserting, and Icon does not specify elsewhere in the proceedings other claims that is asserting besides claims 1 and 2. (Dkt. 23.) In view of this, the court construes Icon's patent infringement cause of action for infringement of claims 1 and 2 of the '799 Patent.

B. Rule 12(c)

As stated, a Rule 12(c) motion is evaluated like a Rule 12(b)(6) motion.¹⁵ Further, a patent “is presumed to be issued properly, absent clear and convincing evidence to the contrary.”¹⁶ Thus, a Rule 12(c) movant must prove ineligibility by clear and convincing evidence within the patent itself.¹⁷

C. Section 101 Eligibility

Section 101 establishes the subject matter that can be patented.¹⁸ It states, “Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”¹⁹

Garmin relies heavily on *In re Nuijten*²⁰ to argue that the “data signal” covered in claims 1 and 2 of the ’799 patent is ineligible subject matter under Section 101. In *Nuijten*, the Federal Circuit found that a transitory signal was not directed to statutory subject matter, despite the fact that the signal had a physical form.²¹ The claim at issue in *Nuijten* read, “A *signal* with embedded supplemental data, the signal being encoded in accordance with a given encoding process and selected samples of the signal representing the supplemental data, and at least one of the samples preceding the selected samples is different from the sample corresponding to the given encoding process.”²² The Federal Circuit acknowledged that the signal had “tangible

¹⁵ See *Atlantic Richfield Co. v. Farm Credit Bank*, 226 F.3d 1138, 1160 (10th Cir. 2000).

¹⁶ *Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA LLC*, No. 13 C 4417, 2014 WL 983123, at *2 (N.D. Ill. Mar. 13, 2014); see also *Microsoft Corp. v. i4i Ltd. P’ship*, 131 S. Ct. 2238, 2242 (2011).

¹⁷ *Vehicle Intelligence & Safety LLC*, 2014 WL 983123, at *2; *Thales Visionix, Inc. v. United States*, 122 Fed. Cl. 245, 250 (2015); see also *Microsoft Corp.*, 131 S.Ct. at 2242.

¹⁸ 35 U.S.C. § 101.

¹⁹ *Id.*

²⁰ 500 F.3d 1346 (Fed. Cir. 2007).

²¹ *Id.* at 1353.

²² *Id.* at 1351.

causes and effects,” but ultimately held that the signal was not directed at statutory subject matter due to its transitory, fleeting nature.²³

Here, both parties put forth proposed constructions of “data signal.” Icon proposes that data signal means “physical carrier of information that is transmitted over a communication channel.” Garmin proposes a different meaning: “an electronic pulse or burst that represents data.” Icon’s construction emphasizes the physical nature of the data signal while Garmin’s construction emphasizes its transitory nature. Neither construction moves Icon’s asserted claims outside *Nuijten*’s scope. Even if the court adopted Icon’s construction, the data signal would still not constitute eligible subject matter because it is transitory and fleeting.²⁴ An analysis of the Section 101 categories supports this conclusion.

Icon contends that the asserted claims are patent eligible as a manufacture. Manufacture in its verb form means “the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery.”²⁵ In its noun form, manufacture “refers to ‘articles’ resulting from the process of manufacture,” meaning “tangible articles or commodities.”²⁶ When considering the signal at issue in *Nuijten*, the Federal Circuit acknowledged that the signal was “man-made and physical” and that it “exists in the real world and has tangible causes and effects.”²⁷ Nevertheless, the court found that “energy embodying the claimed signal is fleeting and is devoid of any semblance of permanence during transmission.”²⁸ Moreover, the signal could only be

²³ *Id.* at 1353, 1356; see also *Digitech Image Technologies, LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344, 1350 (Fed. Cir. 2014).

²⁴ *Cf. Nuijten*, 500 F.3d at 1353, 1356.

²⁵ *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980) (quoting *Am. Fruit Growers, Inc. v. Brogdex Co.*, 283 U.S. 1, 11 (1931)).

²⁶ *Nuijten*, 500 F.3d at 1356.

²⁷ *Id.*

²⁸ *Id.*

perceived by “equipment capable of detecting and interpreting the signal.”²⁹ The court therefore concluded that the transitory nature of the signal precluded it from constituting a manufacture under Section 101.

Similarly, the data signal covered in the asserted claims is physical and has tangible causes and effects but is also transitory in that it does not retain a permanent form. This lack of permanent form leads to the conclusion that the data signal does not constitute a tangible article or commodity and therefore does not constitute a manufacture.

Next, Icon argues that the asserted claims constitute a process under Section 101. A process is a “process, art or method.”³⁰ More precisely, “[a] process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing.”³¹ In *Nuijten*, the Federal Circuit made clear that “[t]he presence of acts recited in the claim does not transform a claim covering a thing—the signal itself—into one covering the process by which that thing was made.”³² Although claims 1 and 2 mention certain acts, they describe the data signal and not the process through which the data signal is created.

At bottom, the court concludes that Icon’s asserted claims do not constitute a manufacture or a process, and Icon does not dispute that the asserted claims do not constitute a machine or composition of matter.

Icon nevertheless argues that the data signal covered in the ’799 patent is distinguishable from the signal at issue in *Nuijten*. In particular, Icon argues that, unlike the signals in *Nuijten*, the asserted claims entail a specific structure, relationship among the data, and application of the

²⁹ *Id.*

³⁰ 35 U.S.C. § 100.

³¹ *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972) (quoting *Cochrane v. Deener*, 94 U.S. 780, 780 (1876)).

³² *Nuijten*, 500 F.3d at 1355.

structure on a communication channel. Despite the differences between the signals in *Nuijten* and the signals at issue here, neither constitutes statutory subject matter because they are transitory and fleeting. And as the analysis above shows, the asserted claims do fall within a statutory category of patentable subject matter.

Icon further contends that *Nuijten* is inconsistent with current Section 101 jurisprudence by pointing to academic criticisms of *Nuijten* and other case law addressing Section 101. Yet Icon cites to no authority establishing that *Nuijten* has been abrogated or overturned. Icon also urges that the asserted claims are patent eligible under *In re Lowry*,³³ in which the Federal Circuit reversed the Patent Office's denial of patentable weight to the applicant's computer memory storage system.³⁴ But *Lowry* did not meaningfully address Section 101, and it was decided before *Nuijten*. Put simply, *Nuijten* is more recent and analogous and is controlling in this instance. Despite academic criticisms and other existing case law, it is not this court's prerogative to depart from what appears to be controlling precedent without clear direction from the Federal Circuit or Supreme Court.

The court concludes that claims 1 and 2 of the '799 patent are not drawn to statutory subject matter. In view of this, the court also concludes that Garmin has shown by clear and convincing evidence within the '799 patent that it is entitled to judgment on the pleadings.

Finally, the court notes that further construction of the disputed terms is unnecessary. The parties briefed and argued three other terms contained in claims 1 and 2: communication channel, operating parameter, and exercise device. As noted, claims 1 and 2 are not drawn to statutory subject matter even if the court accepted Icon's proposed constructions of "data signal." Construction of the additional terms does not affect this conclusion in that the additional terms

³³ 32 F.3d 1579 (Fed. Cir. 1994).

³⁴ *Id.* at 1582–85.

do not alter the transitory nature of the data signal. And rendering unnecessary constructions would be contrary to the general principle that federal courts cannot issue advisory opinions or answer questions that would not impact the parties' rights or causes of action.³⁵

III. MOTION TO AMEND

Federal Rule of Civil Procedure 15(a) states that, after a responsive pleading has been filed, "a party may amend its pleading only with the opposing party's written consent or the court's leave. The court should freely give leave when justice so requires."³⁶ A court may deny as futile a motion for leave to amend if the amended complaint would not withstand a motion to dismiss.³⁷

In Icon's Amended Complaint, it alleged that Garmin indirectly and willfully infringed the '800 Patent, the '271 Patent, the '799 Patent, and the '351 Patent. Garmin moved to dismiss Icon's causes of action for indirect and willful infringement of the patents. Before the hearing on the motion, Icon stipulated to the dismissal of the causes of action related to the '800 Patent and the '271 Patent. At the hearing, the court granted Garmin's Motion and dismissed without prejudice Icon's causes of action for indirect and willful infringement of the '799 Patent and the '351 Patent. Icon subsequently filed a Motion for Leave to File a Second Amended Complaint. The proposed Second Amended Complaint includes additional allegations to support causes of action for indirect and willful infringement of the '799 Patent and the '351 Patent. However, the court has concluded in this Order that, as a matter of law, Icon cannot bring causes of action for infringement of the '799 Patent or the '351 Patent. The asserted claims of the '799 Patent are not drawn to statutory subject matter and the '351 Patent is precluded in view of the *Polar* court's

³⁵ Cf. *U.S. Nat. Bank of Oregon v. Indep. Ins. Agents of Am., Inc.*, 508 U.S. 439, 446 (1993); *Preiser v. Newkirk*, 422 U.S. 395, 401 (1975); *Jordan v. Sosa*, 654 F.3d 1012, 1025 (10th Cir. 2011).

³⁶ Fed. R. Civ. P. 15(a).

³⁷ See *Hall v. Bellmon*, 935 F.2d 1106, 1110 (10th Cir. 1991); *Cobalt Flux, Inc. v. Positive Gaming AS*, No. 2:08-CV-185-TS, 2008 WL 4534182, at *2 (D. Utah Oct. 6, 2008).

ruling. Therefore, the proposed Second Amended Complaint would be futile because it could not withstand a motion to dismiss.

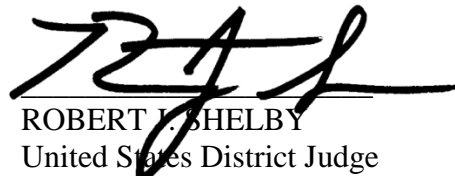
CONCLUSION

For the reasons stated on the record at the October 23, 2013 hearing, the court GRANTS Garmin's Motion to Dismiss (Dkt. 29). For the reasons stated in this Order, the court GRANTS Garmin's Motion for Judgment on the Pleadings (Dkt. 74) and DISMISSES Icon's cause of action for patent infringement of the '799 Patent; DENIES AS MOOT Icon's Motion to Strike (Dkt. 93); DENIES Icon's Motion for Leave to File Second Amended Complaint (Dkt. 105); and GRANTS Garmin's Motion for Judgment on the Pleadings (Dkt. 118) and DISMISSES Icon's cause of action for patent infringement of the '351 Patent.

The court directs the Clerk of Court to close the case.

SO ORDERED this 29th day of September, 2015.

BY THE COURT:



ROBERT J. SHELBY
United States District Judge

AO 450 (Rev.5/85) Judgment in a Civil Case

United States District Court

Northern Division for the District of Utah

ICON HEALTH & FITNESS, a
Delaware corporation,

Plaintiff

JUDGMENT IN A CIVIL CASE

v.

GARMIN LTD, a Swiss corporation,
GARMIN INTERNATIONAL, a Kansas
corporation and GARMIN USA, a Kansas
corporation,

Case Number: 1:11-CV-166-RJS

Defendants

IT IS ORDERED AND ADJUDGED

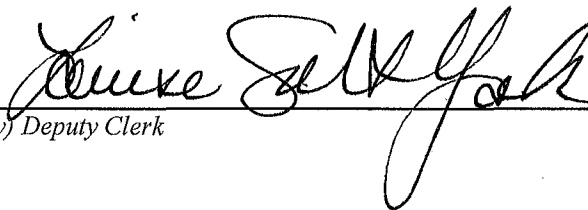
That judgment be entered in favor of the defendant and plaintiff's cause of action is dismissed.

September 29, 2015

Date

D. Mark Jones

Clerk of Court


(By) Deputy Clerk

**US District Court Electronic Case Filing System
District of Utah (Northern)
CIVIL DOCKET FOR CASE #: 1:11-cv-00166-RJS**

Icon Health & Fitness v. Garmin Ltd et al
Assigned to: Judge Robert J. Shelby
Case in other court: Federal Circuit, 16-01166
Cause: 35:0271 Patent Infringement

Date Filed: 11/18/2011
Date Terminated: 09/29/2015
Jury Demand: Plaintiff
Nature of Suit: 830 Patent
Jurisdiction: Federal Question

Plaintiff

Icon Health & Fitness
a Delaware corporation

represented by **David R. Wright**
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Jennifer F. Parrish
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| Date Filed | # | Docket Text |
|------------|--------------------------|--|
| 11/18/2011 | <u>1</u> | COMPLAINT against Garmin International, Garmin Ltd, Garmin USA (Filing fee \$ 350, receipt number 4681047947) (Electronic document provided on disc. Original file stamped and signed document permanently retained), filed by Icon Health & Fitness. (Attachments: # <u>1</u> Civil Cover Sheet) Assigned to Judge Dee Benson (jds) (Entered: 11/21/2011) |
| 11/21/2011 | <u>2</u> | Report on the Filing of an action sent to the Director of the U.S. Patent and |

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| | | Trademark Office. (jds) (Additional attachment(s) added on 11/21/2011: # 1 Copy of Complaint) (jds). (Entered: 11/21/2011) |
| 01/24/2012 | 3 | CORPORATE DISCLOSURE STATEMENT under FRCP 7.1 filed by Plaintiff Icon Health & Fitness identifying HF Holdings, Inc. as Corporate Parent. (Wright, David) (Entered: 01/24/2012) |
| 03/16/2012 | 4 | **RESTRICTED DOCUMENT** Summons Issued Electronically as to Garmin International. Instructions to Counsel: 1. Click on the document number. 2. If you are prompted for an ECF login, enter your 'Attorney' login to CM/ECF. 3. Print the issued summons for service. (rls) (Entered: 03/16/2012) |
| 03/16/2012 | 5 | **RESTRICTED DOCUMENT** Summons Issued Electronically as to Garmin Ltd. Instructions to Counsel: 1. Click on the document number. 2. If you are prompted for an ECF login, enter your 'Attorney' login to CM/ECF. 3. Print the issued summons for service. (rls) (Entered: 03/16/2012) |
| 03/16/2012 | 6 | **RESTRICTED DOCUMENT** Summons Issued Electronically as to Garmin USA. Instructions to Counsel: 1. Click on the document number. 2. If you are prompted for an ECF login, enter your 'Attorney' login to CM/ECF. 3. Print the issued summons for service. (rls) (Entered: 03/16/2012) |
| 03/21/2012 | 7 | **RESTRICTED DOCUMENT** SUMMONS Returned Executed by Icon Health & Fitness as to Garmin USA served on 3/19/2012, answer due 4/9/2012. (Wright, David) (Entered: 03/21/2012) |
| 03/21/2012 | 8 | **RESTRICTED DOCUMENT** SUMMONS Returned Executed by Icon Health & Fitness as to Garmin International served on 3/19/2012, answer due 4/9/2012. (Wright, David) (Entered: 03/21/2012) |
| 03/21/2012 | 9 | **RESTRICTED DOCUMENT** Summons Returned Unexecuted by Icon Health & Fitness as to Garmin Ltd. (Wright, David) (Entered: 03/21/2012) |
| 03/30/2012 | 10 | **RESTRICTED DOCUMENT** Summons Returned Unexecuted by Icon Health & Fitness as to Garmin Ltd. (Wright, David) (Entered: 03/30/2012) |
| 04/06/2012 | 11 | Stipulated MOTION for Extension of Time Responding to Complaint filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Attachments: # 1 Text of Proposed Order)(Haupt, Timothy) (Entered: 04/06/2012) |
| 04/09/2012 | 12 | ORDER granting 11 Motion for Extension of Time. Signed by Judge Dee Benson on 4/9/12 (alt) (Entered: 04/10/2012) |
| 04/17/2012 | 13 | **RESTRICTED DOCUMENT** Summons Issued Electronically as to Garmin Ltd. Instructions to Counsel: 1. Click on the document number. 2. If you are prompted for an ECF login, enter your 'Attorney' login to CM/ECF. 3. Print the issued summons for service. (jds) (Entered: 04/17/2012) |

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| 05/23/2012 | <u>14</u> | Stipulated MOTION for Extension of Time to File Answer re <u>1</u> Complaint, filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Attachments: # <u>1</u> Text of Proposed Order)(Houpt, Timothy) (Entered: 05/23/2012) |
| 05/29/2012 | <u>15</u> | MOTION for Admission Pro Hac Vice of Abran J. Kean , Registration fee \$ 15, receipt number 1088-1600992, filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Attachments: # <u>1</u> Exhibit A - Application for Admission Pro Hac Vice, # <u>2</u> Exhibit B - Electronic Case Filing, # <u>3</u> Text of Proposed Order) (Houpt, Timothy) (Entered: 05/29/2012) |
| 05/29/2012 | <u>16</u> | MOTION for Admission Pro Hac Vice of Adam P. Seitz , Registration fee \$ 15, receipt number 1088-1601020, filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Attachments: # <u>1</u> Exhibit A - Application for Admission Pro Hac Vice, # <u>2</u> Exhibit B - Electronic Case Filing, # <u>3</u> Text of Proposed Order) (Houpt, Timothy) (Entered: 05/29/2012) |
| 05/29/2012 | <u>17</u> | MOTION for Admission Pro Hac Vice of Ajay Sharma , Registration fee \$ 15, receipt number 1088-1601041, filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Attachments: # <u>1</u> Exhibit A - Application for Admission Pro Hac Vice, # <u>2</u> Exhibit B - Electronic Case Filing, # <u>3</u> Text of Proposed Order) (Houpt, Timothy) (Entered: 05/29/2012) |
| 05/31/2012 | <u>18</u> | ORDER granting <u>14</u> Motion for Extension of Time to Answer re <u>14</u> Stipulated MOTION for Extension of Time to File Answer re <u>1</u> Complaint, . Answer deadline updated for Garmin International answer due 6/11/2012; Garmin Ltd answer due 6/11/2012; Garmin USA answer due 6/11/2012.. Signed by Judge Dee Benson on 5/31/12. (jlw) (Entered: 05/31/2012) |
| 05/31/2012 | <u>19</u> | ORDER granting <u>15</u> Motion for Admission Pro Hac Vice of Abran J. Kean,Adam P,. Seitz,Ajay Sharma for Garmin International,Abran J. Kean,Adam P,. Seitz,Ajay Sharma for Garmin Ltd,Abran J. Kean,Adam P,. Seitz,Ajay Sharma for Garmin USA. <i>Attorneys admitted Pro Hac Vice may download a copy of the District of Utahs local rules from the courts web site at http://www.utd.uscourts.gov</i> ; granting <u>16</u> Motion for Admission Pro Hac Vice of Abran J. Kean,Adam P,. Seitz,Ajay Sharma for Garmin International,Abran J. Kean,Adam P,. Seitz,Ajay Sharma for Garmin Ltd,Abran J. Kean,Adam P,. Seitz,Ajay Sharma for Garmin USA. <i>Attorneys admitted Pro Hac Vice may download a copy of the District of Utahs local rules from the courts web site at http://www.utd.uscourts.gov</i> ; granting <u>17</u> Motion for Admission Pro Hac Vice of Abran J. Kean,Adam P,. Seitz,Ajay Sharma for Garmin International,Abran J. Kean,Adam P,. Seitz,Ajay Sharma for Garmin Ltd,Abran J. Kean,Adam P,. Seitz,Ajay Sharma for Garmin USA. <i>Attorneys admitted Pro Hac Vice may download a copy of the District of Utahs local rules from the courts web site at http://www.utd.uscourts.gov</i> . Signed by Judge Dee Benson on 5/31/12. (Attachments: # <u>1</u> PHV - Seitz, # <u>2</u> PHV - Sharma) (jlw) (Entered: 05/31/2012) |
| 06/07/2012 | <u>20</u> | MOTION for Admission Pro Hac Vice of Megan J. Redmond , Registration fee \$ 15, receipt number 1088-1607393, filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Attachments: # <u>1</u> Exhibit A - Application for |

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| | | Admission Pro Hac Vice, # 2 Exhibit B - Electronic Case Filing, # 3 Text of Proposed Order)(Houpt, Timothy) (Entered: 06/07/2012) |
| 06/07/2012 | 21 | CERTIFICATE OF SERVICE by Icon Health & Fitness re 1 Complaint, 13 Summons Issued Electronically, <i>Served in Compliance with the Hague Convention</i> (Jolley, Gregory) (Entered: 06/07/2012) |
| 06/07/2012 | 22 | MOTION for Admission Pro Hac Vice of Eric A. Buresh , Registration fee \$ 15, receipt number 1088-1607406, filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Attachments: # 1 Exhibit A - Application for Admission Pro Hac Vice, # 2 Exhibit B - Electronic Case Filing, # 3 Text of Proposed Order) (Houpt, Timothy) (Entered: 06/07/2012) |
| 06/07/2012 | 24 | NOTICE OF DEFICIENCY re 22 MOTION for Admission Pro Hac Vice of Eric A. Buresh , Registration fee \$ 15, receipt number 1088-1607406. The image of the Motion for Admission Pro Hac Vice is not attached to this entry, just the exhibits. The clerk requests the filer of the original document to refile the pleading. The new pleading will receive a new document number on the docket. (jlw) (Entered: 06/11/2012) |
| 06/08/2012 | 23 | AMENDED COMPLAINT against Garmin International, Garmin Ltd, Garmin USA with Jury Demand., filed by Icon Health & Fitness. (Wright, David) (Entered: 06/08/2012) |
| 06/11/2012 | 25 | MOTION for Admission Pro Hac Vice of Eric A. Buresh , Registration fee \$ 15, receipt number 1088-1607406, filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Attachments: # 1 Exhibit A - Application for Admission Pro Hac Vice, # 2 Exhibit B - Electronic Case Filing, # 3 Text of Proposed Order) (Houpt, Timothy) (Entered: 06/11/2012) |
| 06/11/2012 | 26 | ORDER granting 20 Motion for Admission Pro Hac Vice of Megan J. Redmond for Garmin International,Megan J. Redmond for Garmin Ltd,Megan J. Redmond for Garmin USA. <i>Attorneys admitted Pro Hac Vice may download a copy of the District of Utahs local rules from the courts web site at http://www.utd.uscourts.gov</i> . Signed by Judge Dee Benson on 6/8/12. (jlw) (Entered: 06/11/2012) |
| 06/11/2012 | 27 | ORDER granting 25 Motion for Admission Pro Hac Vice of Eric A. Buresh for Garmin International,Eric A. Buresh for Garmin Ltd,Eric A. Buresh for Garmin USA. <i>Attorneys admitted Pro Hac Vice may download a copy of the District of Utahs local rules from the courts web site at http://www.utd.uscourts.gov</i> . Signed by Judge Dee Benson on 6/8/12. (jlw) (Entered: 06/11/2012) |
| 06/25/2012 | 28 | ANSWER to 23 Amended Complaint filed by Garmin International, Garmin Ltd, Garmin USA.(Houpt, Timothy) (Entered: 06/25/2012) |
| 06/25/2012 | 29 | MOTION to Dismiss (<i>Partial</i>) <i>Icon's indirect and willful infringement claims</i> filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Houpt, Timothy) (Entered: 06/25/2012) |
| 06/25/2012 | 30 | MEMORANDUM in Support re 29 MOTION to Dismiss (<i>Partial</i>) <i>Icon's indirect and willful infringement claims</i> filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Houpt, Timothy) (Entered: 06/25/2012) |

| | | |
|------------|---------------------------|---|
| 06/25/2012 | <u>31</u> | CORPORATE DISCLOSURE STATEMENT under FRCP 7.1 filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Haupt, Timothy) (Entered: 06/25/2012) |
| 06/26/2012 | 32 | NOTICE FROM THE COURT re: Initial Scheduling The court's IPT Clerk will now set the case for the Initial Pretrial Scheduling Conference (tls) (Entered: 06/26/2012) |
| 06/26/2012 | <u>33</u> | NOTICE OF ADR, e-mailed or mailed to Defendants Garmin International, Garmin Ltd, Garmin USA, Plaintiff Icon Health & Fitness. (tls) (Entered: 06/26/2012) |
| 07/02/2012 | 34 | <u>NOTICE OF INITIAL PRETRIAL CONFERENCE:</u> (Notice generated by Theresa Brown) The Attorneys Planning Meeting Report and Proposed Scheduling Order forms, available on the court web site at http://www.utd.uscourts.gov/documents/formpage.html , should be prepared 30 days before the Initial Pretrial Conference hearing date. <u>NOTICE TO COUNSEL,</u> The Court <i>may</i> enter a scheduling order and vacate the hearing <i>if</i> counsel (a) file a stipulated Attorneys Planning Meeting Report ; and (b) e-mail a Proposed Scheduling Order to ipt@utd.uscourts.gov 30 days before the scheduled hearing. See instructions at http://www.utd.uscourts.gov/documents/ipt.html Initial Pretrial Conference set for 9/12/2012 10:30 AM in Room 477 before Magistrate Judge Evelyn J. Furse. (tab) (Entered: 07/02/2012) |
| 07/02/2012 | <u>35</u> | MOTION for Admission Pro Hac Vice of Caroline A. Bader , Registration fee \$ 15, receipt number 1088-1623394, filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Attachments: # <u>1</u> Exhibit A - Application for Admission Pro Hac Vice, # <u>2</u> Exhibit B - Electronic Case Filing, # <u>3</u> Text of Proposed Order)(Haupt, Timothy) (Entered: 07/02/2012) |
| 07/03/2012 | <u>36</u> | ORDER granting <u>35</u> Motion for Admission Pro Hac Vice of Caroline A. Bader for Garmin International, Caroline A. Bader for Garmin Ltd, Caroline A. Bader for Garmin USA. <i>Attorneys admitted Pro Hac Vice may download a copy of the District of Utahs local rules from the courts web site at http://www.utd.uscourts.gov</i> Signed by Judge Dee Benson on 7/3/12. (jlw) (Entered: 07/03/2012) |
| 07/26/2012 | <u>37</u> | MEMORANDUM in Opposition re <u>29</u> MOTION to Dismiss (<i>Partial</i>) <i>Icon's indirect and willful infringement claims</i> filed by Plaintiff Icon Health & Fitness. (Wright, David) (Entered: 07/26/2012) |
| 08/02/2012 | <u>38</u> | NOTICE of Appearance by Larry R. Laycock on behalf of Icon Health & Fitness (Laycock, Larry) (Entered: 08/02/2012) |
| 08/08/2012 | <u>39</u> | NOTICE of Appearance by Kristine M. Larsen on behalf of Garmin International, Garmin Ltd, Garmin USA (Larsen, Kristine) (Entered: 08/08/2012) |
| 08/08/2012 | <u>40</u> | NOTICE OF WITHDRAWAL OF COUNSEL of Brent P. Lorimer filed by Brent P. Lorimer on behalf of Icon Health & Fitness (Lorimer, Brent) (Entered: 08/08/2012) |

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| 08/08/2012 | 41 | NOTICE OF WITHDRAWAL OF COUNSEL of Timothy C. Houpt filed by Timothy C. Houpt on behalf of Garmin International, Garmin Ltd, Garmin USA (Houpt, Timothy) (Entered: 08/08/2012) |
| 08/13/2012 | 42 | REPLY to Response to Motion re 29 MOTION to Dismiss <i>(Partial) Icon's indirect and willful infringement claims</i> filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Larsen, Kristine) (Entered: 08/13/2012) |
| 08/13/2012 | 43 | REPORT OF ATTORNEY PLANNING MEETING. (Jolley, Gregory) (Entered: 08/13/2012) |
| 08/22/2012 | 44 | NOTICE OF WITHDRAWAL OF COUNSEL of Kirk R. Harris filed by Jared J. Braithwaite on behalf of Icon Health & Fitness (Braithwaite, Jared) (Entered: 08/22/2012) |
| 08/23/2012 | 45 | <u>NOTICE OF HEARING ON MOTION</u> re: 29 MOTION to Dismiss <i>(Partial) Icon's indirect and willful infringement claims</i> : (Notice generated by chambers) Motion Hearing set for 10/23/2012 02:30 PM in Room 246 before Judge Dee Benson. (reb) (Entered: 08/23/2012) |
| 09/04/2012 | 46 | SCHEDULING ORDER: Initial Pretrial Conference vacated. Amended Pleadings due by 12/17/2012. Joinder of Parties due by 12/17/2012. See order for details. Signed by Magistrate Judge Evelyn J. Furse on 09/04/2012. (asp) (Entered: 09/04/2012) |
| 09/18/2012 | 47 | Stipulated MOTION to Dismiss Party Garmin Ltd. <i>without Prejudice</i> filed by Defendants Garmin International, Garmin Ltd, Garmin USA. (Attachments: # 1 Text of Proposed Order Proposed Order)(Larsen, Kristine) (Entered: 09/18/2012) |
| 09/25/2012 | 48 | ORDER granting 47 Motion to Dismiss Party. Garmin Ltd (a Swiss corporation) terminated. Signed by Judge Dee Benson on 9/24/12. (jlw) (Entered: 09/26/2012) |
| 10/10/2012 | 49 | REASSIGNMENT to Newly Appointed District Judge. Case Reassigned to District Judge Robert J. Shelby. Judge Dee Benson no longer assigned to the case. Case number will now read 1:11-cv-00166-RJS. Please make changes to document captions accordingly. (cas) (Entered: 10/10/2012) |
| 10/11/2012 | 50 | MOTION for Admission Pro Hac Vice of Nicholas Groombridge , Registration fee \$ 15, receipt number 1088-1693618, filed by Defendants Garmin International, Garmin USA. (Attachments: # 1 Exhibit A - PHV Application, # 2 Exhibit B - ECF Registration, # 3 Text of Proposed Order C - Proposed Order) (Larsen, Kristine) (Entered: 10/11/2012) |
| 10/11/2012 | 51 | MOTION for Admission Pro Hac Vice of Jennifer Wu , Registration fee \$ 15, receipt number 1088-1693718, filed by Defendants Garmin International, Garmin USA. (Attachments: # 1 Exhibit A - PHV Application, # 2 Exhibit B - ECF Registration, # 3 Text of Proposed Order C - Proposed Order)(Larsen, Kristine) (Entered: 10/11/2012) |
| 10/12/2012 | | <u>NOTICE VACATING Hearing on Motion to Dismiss (Partial) Icon's indirect and willful infringement claims HEARING</u> set for 10/23/12 at 2:30 p.m. before Judge Robert J. Shelby (previously set in front of Judge Dee Benson). The hearing will be reset at a later date. (Notice generated by Chambers). (acb) (Entered: 10/12/2012) |

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| 10/12/2012 | 52 | ORDER granting 50 Motion for Admission Pro Hac Vice of Nicholas Groombridge,Jennifer H. Wu for Garmin International,Nicholas Groombridge,Jennifer H. Wu for Garmin USA. <i>Attorneys admitted Pro Hac Vice may download a copy of the District of Utahs local rules from the courts web site at http://www.utd.uscourts.gov</i> ; granting 51 Motion for Admission Pro Hac Vice of Nicholas Groombridge,Jennifer H. Wu for Garmin International,Nicholas Groombridge,Jennifer H. Wu for Garmin USA. <i>Attorneys admitted Pro Hac Vice may download a copy of the District of Utahs local rules from the courts web site at http://www.utd.uscourts.gov</i> . Signed by Judge Robert J. Shelby on 10/11/2012. (asp) (Entered: 10/12/2012) |
| 10/21/2012 | 53 | <u>NOTICE OF HEARING ON MOTION</u> re: 29 MOTION to Dismiss (<i>Partial</i>) <i>Icon's indirect and willful infringement claims</i> : (Notice generated by Mary Jane McNamee) Motion Hearing set for 1/23/2013 at 2:30 PM in Room 220 before Judge Robert J. Shelby. (mjm) (Entered: 10/21/2012) |
| 11/06/2012 | 54 | SUBSTITUTION OF COUNSEL Larry R. Laycock as counsel on behalf of Icon Health & Fitness. (Laycock, Larry) (Entered: 11/06/2012) |
| 11/06/2012 | 55 | NOTICE OF WITHDRAWAL OF COUNSEL of Gregory E. Jolley filed by Gregory E. Jolley on behalf of Icon Health & Fitness (Jolley, Gregory) (Entered: 11/06/2012) |
| 11/13/2012 | 56 | NOTICE of REMOVING COUNSEL FROM SERVICE LIST filed by Gregory E. Jolley. Attorney Gregory E. Jolley will no longer receive notice from the court in this case including final judgment. (Jolley, Gregory) (Entered: 11/13/2012) |
| 11/30/2012 | 57 | NOTICE of Appearance by Adam B. Beckstrom on behalf of Icon Health & Fitness (Beckstrom, Adam) (Entered: 11/30/2012) |
| 12/10/2012 | 58 | Joint MOTION for Protective Order filed by Plaintiff Icon Health & Fitness. (Attachments: # 1 Text of Proposed Order Proposed Stipulated Protective Order) (Braithwaite, Jared) (Entered: 12/10/2012) |
| 12/18/2012 | 59 | MOTION for Admission Pro Hac Vice of Tadahiro Kaburaki , Registration fee \$ 15, receipt number 1088-1738599, filed by Defendants Garmin International, Garmin USA. (Attachments: # 1 Exhibit Exh A - Application, # 2 Exhibit Exh B - Electronic Registration Form, # 3 Exhibit Exh C - Proposed Order)(Larsen, Kristine) (Entered: 12/18/2012) |
| 12/18/2012 | 60 | ORDER granting 59 Motion for Admission Pro Hac Vice of Tadahiro Kaburaki for Garmin International,Tadahiro Kaburaki for Garmin USA. <i>Attorneys admitted Pro Hac Vice may download a copy of the District of Utahs local rules from the courts web site at http://www.utd.uscourts.gov</i> . Signed by Judge Robert J. Shelby on 12/18/2012. (tls) (Entered: 12/18/2012) |
| 12/18/2012 | 61 | Stipulated PROTECTIVE ORDER. Signed by Judge Robert J. Shelby on 12/18/2012. (tls) (Entered: 12/18/2012) |
| 12/28/2012 | 62 | <u>AMENDED NOTICE OF HEARING ON MOTION</u> re: 29 MOTION to Dismiss (<i>Partial</i>) <i>Icon's indirect and willful infringement claims</i> : (Notice |

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| | | generated by Mary Jane McNamee) Motion Hearing reset for 5/16/2013 at 2:30 PM in Room 220 before Judge Robert J. Shelby. (mjm) (Entered: 12/28/2012) |
| 02/19/2013 | 63 | NOTICE of Change of Address by Larry R. Laycock (Laycock, Larry) (Entered: 02/19/2013) |
| 04/03/2013 | 64 | <u>AMENDED NOTICE OF HEARING ON MOTION</u> re: 29 MOTION to Dismiss <i>(Partial) Icon's indirect and willful infringement claims</i> : (Notice generated by Mary Jane McNamee) Motion Hearing RESET for 9/10/2013 at 2:30 PM in Room 220 before Judge Robert J. Shelby. (mjm) (Entered: 04/03/2013) |
| 04/09/2013 | 65 | Stipulated MOTION to Dismiss <i>ICON Health & Fitness, Inc.'s First and Second Claims for Relief without Prejudice</i> filed by Plaintiff Icon Health & Fitness. (Attachments: # 1 Text of Proposed Order Proposed Order)(Braithwaite, Jared) (Entered: 04/09/2013) |
| 04/11/2013 | 66 | ORDER granting 65 Motion to Dismiss. Signed by Judge Robert J. Shelby on 04/11/2013. (asp) (Entered: 04/11/2013) |
| 04/24/2013 | 67 | Joint MOTION for Extension of Time to file Joint Claim Construction and Prehearing Statement filed by Plaintiff Icon Health & Fitness. (Attachments: # 1 Text of Proposed Order Proposed Order)(Braithwaite, Jared) (Entered: 04/24/2013) |
| 04/25/2013 | 68 | ORDER granting 67 Joint Motion for Extension of Time to File Joint Claim Construction and Prehearing Statement. Signed by Judge Robert J. Shelby on 04/25/2013. (tls) (Entered: 04/25/2013) |
| 05/01/2013 | 69 | NOTICE OF FILING of Joint Claim Construction and Prehearing Statement filed by Plaintiff Icon Health & Fitness. (Attachments: # 1 Exhibit Exhibit A - Agreed Constructions, # 2 Exhibit Exhibit B - Disputed Constructions)(Braithwaite, Jared) Modified on 5/3/2013 by adding document caption to text (tls). (Entered: 05/01/2013) |
| 05/03/2013 | 70 | Modification of Docket: Error: Document filed as Notice of Filing with no description. Correction: Added document caption to docket entry text re 69 Notice of Filing. (tls) (Entered: 05/03/2013) |
| 06/03/2013 | 71 | REQUEST for Hearing Regarding Claim Construction <i>(Joint Request)</i> filed by Plaintiff Icon Health & Fitness. (Braithwaite, Jared) (Entered: 06/03/2013) |
| 06/06/2013 | 72 | Opening Claim Construction BRIEF filed by Plaintiff Icon Health & Fitness. (Attachments: # 1 Exhibit US Patent No. 6,626,799, # 2 Exhibit US Patent No. 6,921,351, # 3 Exhibit Pages from Chicago Manual of Style)(Wright, David) (Entered: 06/06/2013) |
| 06/12/2013 | 73 | <u>AMENDED NOTICE OF HEARING ON MOTION</u> re: Claim Construction AND 29 MOTION to Dismiss <i>(Partial) Icon's indirect and willful infringement claims</i> : (Notice generated by Mary Jane McNamee) Claim Construction Hearing and Motion Hearing set for 9/10/2013 at 2:30 PM in Room 220 before Judge Robert J. Shelby. (mjm) (Entered: 06/12/2013) |
| 06/26/2013 | 74 | MOTION for Judgment on the Pleadings and Memorandum in Support filed by Defendants Garmin International, Garmin USA. (Attachments: # 1 Exhibit 1 - 799 Patent)(Bader, Caroline) (Entered: 06/26/2013) |

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| 06/26/2013 | 75 | Responsive Claim Construction BRIEF re 72 Brief filed by Defendants Garmin International, Garmin USA. (Bader, Caroline) (Entered: 06/26/2013) |
| 07/08/2013 | 76 | STIPULATED MOTION re 72 Brief to <i>Substitute Exhibit</i> by Icon Health & Fitness. (Attachments: # 1 Exhibit A - US Patent 6,626,799, # 2 Text of Proposed Order Proposed Order)(Braithwaite, Jared) Modified on 7/9/2013 by changing event type to Motion for Miscellaneous Relief (tls). (Entered: 07/08/2013) |
| 07/08/2013 | 77 | REPLY BRIEF re 75 Brief <i>Reply to Garmin's Claim Construction Brief</i> filed by Plaintiff Icon Health & Fitness. (Laycock, Larry) (Entered: 07/08/2013) |
| 07/10/2013 | 78 | <u>NOTICE OF HEARING ON MOTION</u> re: 74 MOTION for Judgment on the Pleadings and Memorandum in Support AND 29 MOTION to Dismiss (<i>Partial</i>) <i>Icon's indirect and willful infringement claims</i> , Claim Construction Hearing: (Notice generated by Mary Jane McNamee) Motion Hearing and Claim Construction Hearing set for 9/10/2013 at 2:30 PM in Room 220 before Judge Robert J. Shelby. (mjm) <i>Please Note: Additional motion will be heard on 9/10/2013 (Entered: 07/10/2013)</i> |
| 07/15/2013 | 79 | Stipulated MOTION to Seal and <i>Substitute Exhibit</i> re 72 Brief filed by Plaintiff Icon Health & Fitness. (Attachments: # 1 Exhibit A- U.S. Patent 6,626,799, # 2 Text of Proposed Order)(Braithwaite, Jared) (Entered: 07/15/2013) |
| 07/15/2013 | 80 | ORDER granting 79 Motion to Seal. Signed by Judge Robert J. Shelby on 07/15/2013. (asp) (Entered: 07/15/2013) |
| 07/15/2013 | 81 | EXHIBIT 1 filed by Icon Health & Fitness re 72 Brief. (asp) (Entered: 07/15/2013) |
| 07/15/2013 | 82 | DOCKET TEXT ORDER terminating 76 Motion Terminated as moot per 80 . Signed by Judge Robert J. Shelby on 7/15/2013. No attached document. (djk) (Entered: 07/15/2013) |
| 07/29/2013 | 83 | MEMORANDUM in Opposition re 74 MOTION for Judgment on the Pleadings and Memorandum in Support filed by Plaintiff Icon Health & Fitness. (Braithwaite, Jared) (Entered: 07/29/2013) |
| 07/30/2013 | 84 | <u>AMENDED NOTICE OF HEARING ON MOTION</u> re: 74 MOTION for Judgment on the Pleadings and Memorandum in Support , 29 MOTION to Dismiss (<i>Partial</i>) <i>Icon's indirect and willful infringement claims</i> : (Notice generated by Mary Jane McNamee) Motion Hearing RESET for 9/26/2013 AT 2:30 PM in Room 220 before Judge Robert J. Shelby. <i>Please Note: Previous hearing date of 9/10/2013 is vacated and matters will be heard on 9/26/2013 at 2:30 p.m. (mjm) (Entered: 07/30/2013)</i> |
| 07/30/2013 | 85 | <u>CORRECTED AMENDED NOTICE OF HEARING ON MOTION</u> re: 74 MOTION for Judgment on the Pleadings and Memorandum in Support , 29 MOTION to Dismiss (<i>Partial</i>) <i>Icon's indirect and willful infringement claims</i> AND Claim Construction Hearing: (Notice generated by Mary Jane McNamee) Motions Hearing AND Claim Construction Hearing reset for 9/26/2013 at 2:30 PM in Room 220 before Judge Robert J. Shelby. <i>Please Note: Previous hearing date of 9/10/2013 is vacated and matters will be heard on 9/26/2013 at 2:30 p.m. (mjm) (Entered: 07/30/2013)</i> |

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| 08/12/2013 | <u>86</u> | REPLY to Response to Motion re <u>74</u> MOTION for Judgment on the Pleadings and Memorandum in Support filed by Defendants Garmin International, Garmin USA. (Bader, Caroline) (Entered: 08/12/2013) |
| 08/21/2013 | 87 | <u>AMENDED NOTICE OF HEARING ON MOTION</u> re: <u>74</u> MOTION for Judgment on the Pleadings and Memorandum in Support , <u>29</u> MOTION to Dismiss <i>(Partial) Icon's indirect and willful infringement claims</i> AND Claim Construction: (Notice generated by Mary Jane McNamee) <i>Claim Construction and Motion Hearing RESET for 10/23/2013 AT 9:30 AM in Room 220 before Judge Robert J. Shelby. (mjm)</i> (Entered: 08/21/2013) |
| 10/11/2013 | <u>88</u> | MOTION to Withdraw <i>(UNOPPOSED) Portions of Garmin's Partila Motion to Dismiss and Memorandum in Support</i> filed by Defendants Garmin International, Garmin USA. (Larsen, Kristine) (Entered: 10/11/2013) |
| 10/21/2013 | <u>89</u> | ORDER granting <u>88</u> Motion to Withdraw Portions of <u>65</u> Stipulated MOTION to Dismiss <i>ICON Health & Fitness, Inc.'s First and Second Claims for Relief without Prejudice. Signed by Judge Robert J. Shelby on 10/20/2013. (tls)</i> (Entered: 10/21/2013) |
| 10/23/2013 | 90 | Minute Entry for proceedings held before Judge Robert J. Shelby: Motion Hearing held on 10/23/2013, re: <u>29</u> MOTION to Dismiss <i>(Partial) Icon's indirect and willful infringement claims</i> filed by Garmin USA, Garmin Ltd, Garmin International and <u>74</u> MOTION for Judgment on the Pleadings and Memorandum in Support filed by Garmin USA, Garmin International. The court hears oral argument. The court granted Defendants' Partial Motion to Dismiss Plaintiff's claims for indirect and willful infringement of the '351 patent, docket <u>29</u> . Those claims are dismissed without prejudice. The court heard argument on Defendants' Motion for Judgment on the Pleadings, docket <u>74</u> , which the court took under advisement. Claim construction argument heard and is taken under advisement. By Friday, October 26, 2013, the parties will notify the court of any further agreed-to claim construction. Attorney for Plaintiff: Adam Beckstrom, Jared Braithwaite, David Wright, Attorney for Defendant: Megan Redmond, Adam Seitz. Court Reporter: Ray Fenlon.(mjm) (Entered: 10/24/2013) |
| 10/25/2013 | <u>91</u> | NOTICE of Agreement Regarding Construction of Additional Claim Term by Icon Health & Fitness (Braithwaite, Jared) (Entered: 10/25/2013) |
| 10/25/2013 | <u>92</u> | NOTICE of Modified Proposed Constructions by Garmin International, Garmin USA (Bader, Caroline) (Entered: 10/25/2013) |
| 10/28/2013 | <u>93</u> | MOTION to Strike <u>92</u> Notice (Other) filed by Plaintiff Icon Health & Fitness. (Attachments: # <u>1</u> Text of Proposed Order)(Braithwaite, Jared) (Entered: 10/28/2013) |
| 11/04/2013 | <u>94</u> | NOTICE OF FILING OF OFFICIAL TRANSCRIPT of MOTION TO DISMISS held on OCTOBER 23, 2013 before Judge ROBERT J. SHELBY. Court Reporter/Transcriber RAYMOND P. FENLON, Telephone number (801) 809-4634. NOTICE RE REDACTION OF TRANSCRIPTS: Within 7 business days of this filing, each party shall inform the Court, by filing a Notice of Intent to Redact, of the parties intent to redact personal data identifiers from the |

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| | | <p>electronic transcript of the court proceeding. The policy and forms are located on the court's website at www.utd.uscourts.gov. Please read this policy carefully. If no Notice of Intent to Redact is filed within the allotted time, this transcript will be made electronically available on the date set forth below.</p> <p>Transcript may be viewed at the court public terminal or purchased through the Court Reporter/Transcriber before the deadline for Release of Transcript Restriction. After that date it may be obtained through PACER. Redaction Request due 11/25/2013. Redacted Transcript Deadline set for 12/5/2013. Release of Transcript Restriction set for 2/3/2014. (asp) Modified on 2/3/2014 by removing restricted text(las). (Entered: 11/04/2013)</p> |
| 11/25/2013 | 96 | MOTION to Reassign Case and Memorandum in Support filed by Plaintiff Icon Health & Fitness. (Attachments: # 1 Text of Proposed Order Proposed Order) (Braithwaite, Jared) (Entered: 11/25/2013) |
| 11/25/2013 | 97 | **ENTRY ERROR - Document filed in incorrect case. Filer will refile in correct case. MOTION for Scheduling Order and Memorandum in Support <i>to Reset Claim Construction Procedures</i> filed by Plaintiff Icon Health & Fitness. (Attachments: # 1 Text of Proposed Order Proposed Order)(Braithwaite, Jared) Modified on 11/26/2013 by adding entry error text (tls). (Entered: 11/25/2013) |
| 11/25/2013 | 98 | **ENTRY ERROR - Document filed in incorrect case. Document to be refiled in correct case. AFFIDAVIT/DECLARATION of Jared J. Braithwaite in Support re 97 MOTION for Scheduling Order and Memorandum in Support <i>to Reset Claim Construction Procedures</i> filed by Plaintiff Icon Health & Fitness. (Attachments: # 1 Exhibit Polar's Preliminary Claim Constructions)(Braithwaite, Jared) Modified on 11/26/2013 by adding entry error text (tls). (Entered: 11/25/2013) |
| 11/26/2013 | 99 | Modification of Docket: Error: Documents filed in incorrect case. Correction: Filer will refile in correct case. Terminated pending motion re 98 Affidavit/Declaration in Support of Motion, 97 MOTION for Scheduling Order and Memorandum in Support <i>to Reset Claim Construction Procedures</i> . (tls) (Entered: 11/26/2013) |
| 11/27/2013 | 100 | NOTICE of Appearance by James E. Magleby on behalf of Polar Electro Inc., Polar Electro Oy (Magleby, James) (Entered: 11/27/2013) |
| 11/27/2013 | 101 | NOTICE of Appearance by Jennifer F. Parrish on behalf of Polar Electro Inc., Polar Electro Oy (Parrish, Jennifer) (Entered: 11/27/2013) |
| 11/27/2013 | 102 | MOTION to Intervene and Memorandum in Support filed by Movants Polar Electro Inc., Polar Electro Oy. (Attachments: # 1 Exhibit 1 - Oppn to ICON's Mot to Transfer, # 2 Text of Proposed Order Granting Mot to Intervene)(Parrish, Jennifer) (Entered: 11/27/2013) |
| 12/16/2013 | 103 | REPLY to Response to Motion re 96 MOTION to Reassign Case and Memorandum in Support filed by Plaintiff Icon Health & Fitness. (Beckstrom, Adam) (Entered: 12/16/2013) |
| 12/19/2013 | 104 | ***ENTRY ERROR - Document inadvertently filed - per counsel. AMENDED COMPLAINT against Garmin International, Garmin Ltd, Garmin USA with Jury |

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| | | Demand, filed by Icon Health & Fitness. (Wright, David) Modified on 12/20/2013 by adding entry error text (tls). (Entered: 12/19/2013) |
| 12/20/2013 | <u>105</u> | Plaintiff's MOTION for Leave to File Second Amended Complaint filed by Plaintiff Icon Health & Fitness. (Attachments: # <u>1</u> Exhibit 1 - [proposed] Second Amended Complaint, # <u>2</u> Text of Proposed Order)(Braithwaite, Jared) (Entered: 12/20/2013) |
| 12/31/2013 | <u>106</u> | MOTION for Extension of Time to File Response/Reply - <i>UNOPPOSED</i> - filed by Defendants Garmin International, Garmin USA. (Attachments: # <u>1</u> Text of Proposed Order Proposed Order)(Larsen, Kristine) (Entered: 12/31/2013) |
| 01/02/2014 | <u>107</u> | ORDER granting <u>106</u> Motion for Extension of Time to File Response/Reply re <u>105</u> Plaintiff's MOTION for Leave to File Second Amended Complaint Responses due by 1/17/2014. Signed by Judge Robert J. Shelby on 01/02/2014. (tls) (Entered: 01/02/2014) |
| 01/08/2014 | <u>108</u> | ORDER granting <u>102</u> Motion to Intervene for the Limited Purpose of Opposing Icon Health & Fitness, Inc.'s Motion for Transfer of Related Case. Signed by Judge Robert J. Shelby on 01/08/2014. (tls) (Entered: 01/08/2014) |
| 01/08/2014 | <u>109</u> | MEMORANDUM in Opposition re <u>96</u> MOTION to Reassign Case and Memorandum in Support filed by Intervenor Parties Polar Electro Inc., Polar Electro Oy. (Parrish, Jennifer) (Entered: 01/08/2014) |
| 01/09/2014 | <u>110</u> | ORDER denying <u>96</u> Motion for Transfer of Related Case. Signed by Judge Robert J. Shelby on 01/08/2014. (tls) (Entered: 01/09/2014) |
| 01/17/2014 | <u>111</u> | RESPONSE to Motion re <u>105</u> Plaintiff's MOTION for Leave to File Second Amended Complaint filed by Defendants Garmin International, Garmin USA. (Attachments: # <u>1</u> Exhibit 1)(Bader, Caroline) (Entered: 01/17/2014) |
| 01/22/2014 | <u>112</u> | NOTICE of SUPPLEMENTAL AUTHORITY by Icon Health & Fitness re <u>74</u> MOTION for Judgment on the Pleadings and Memorandum in Support (Braithwaite, Jared) (Entered: 01/22/2014) |
| 02/03/2014 | <u>113</u> | REPLY to Response to Motion re <u>105</u> Plaintiff's MOTION for Leave to File Second Amended Complaint filed by Plaintiff Icon Health & Fitness. (Attachments: # <u>1</u> Exhibit Index, # <u>2</u> Exhibit A-ICON's Second Amended Complaint, # <u>3</u> Exhibit B-Labyrinth Optical Tech., LLC v. Fujitsu Am., Inc.) (Braithwaite, Jared) (Entered: 02/03/2014) |
| 02/13/2014 | <u>114</u> | NOTICE of Correction by Garmin International, Garmin USA re <u>113</u> Reply Memorandum/Reply to Response to Motion, (Attachments: # <u>1</u> Exhibit) (Bader, Caroline) (Entered: 02/13/2014) |
| 06/25/2014 | <u>115</u> | NOTICE of SUPPLEMENTAL AUTHORITY by Icon Health & Fitness re <u>74</u> MOTION for Judgment on the Pleadings and Memorandum in Support (Attachments: # <u>1</u> Exhibit A - Alice Corp. Party Ltd. v. CLS Bank Int'l) (Braithwaite, Jared) (Entered: 06/25/2014) |
| 08/14/2014 | <u>116</u> | NOTICE of Regarding Activity in Related Case by Garmin International, Garmin USA (Attachments: # <u>1</u> Exhibit A) (Seitz, Adam) (Entered: 08/14/2014) |
| 10/24/2014 | <u>117</u> | NOTICE OF WITHDRAWAL OF COUNSEL of Ajay Sharma filed by Kristine |

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| | | M. Larsen on behalf of Garmin International, Garmin USA (Larsen, Kristine) (Entered: 10/24/2014) |
| 06/02/2015 | 118 | MOTION for Judgment on the Pleadings and Memorandum in Support filed by Defendants Garmin International, Garmin USA. (Attachments: # 1 Exhibit A) (Bader, Caroline) (Entered: 06/02/2015) |
| 07/06/2015 | 119 | MEMORANDUM in Opposition re 118 MOTION for Judgment on the Pleadings and Memorandum in Support filed by Plaintiff Icon Health & Fitness. (Attachments: # 1 Exhibit A-Def Preliminary Invalidity Contentions)(Braithwaite, Jared) (Entered: 07/06/2015) |
| 07/21/2015 | 120 | REPLY to Response to Motion re 118 MOTION for Judgment on the Pleadings and Memorandum in Support filed by Defendants Garmin International, Garmin USA. (Bader, Caroline) (Entered: 07/21/2015) |
| 07/28/2015 | 121 | NOTICE of Activity in Case No. 1:11-cv-167-BSJ by Icon Health & Fitness (Braithwaite, Jared) (Entered: 07/28/2015) |
| 09/29/2015 | 122 | MEMORANDUM DECISION AND ORDER granting 74 Motion for Judgment on the Pleadings ; finding as moot 93 Motion to Strike ; denying 105 Motion for Leave to File; granting 118 Motion for Judgment on the Pleadings ; granting 29 Motion to Dismiss. The court directs the Clerk of Court to close the case. Signed by Judge Robert J. Shelby on 9/29/2015. (jds) (Entered: 09/29/2015) |
| 09/29/2015 | 123 | CLERK'S JUDGMENT - IT IS ORDERED AND ADJUDGED That judgment be entered in favor of the defendant and plaintiff's cause of action is dismissed, signed by LSY, Chief Deputy Clerk. Case Closed. (jds) (Entered: 09/29/2015) |
| 10/02/2015 | 124 | Report on the Final Decision of an action sent to the Director of the U.S. Patent and Trademark Office. (jds) (Entered: 10/02/2015) |
| 10/29/2015 | 125 | NOTICE OF APPEAL as to 123 Clerk's Judgment, 122 Order on Motion for Judgment on the Pleadings, Order on Motion to Strike, Order on Motion for Leave to File,, Order on Motion to Dismiss, Memorandum Decision,,,,, filed by Icon Health & Fitness. Appeals to the USCA for the Federal Circuit. Filing fee \$ 505, receipt number 1088-2369787. (Braithwaite, Jared) (Entered: 10/29/2015) |
| 10/30/2015 | 126 | Transmission of Preliminary Record to USCA re 125 Notice of Appeal, (Attachments: # 1 Appendix)(jds) (Entered: 10/30/2015) |
| 11/03/2015 | 127 | Transmission of Preliminary Record to USCA Federal Circuit re 125 Notice of Appeal. (Attachments: # 1 Appendix)(jmr) (Entered: 11/03/2015) |
| 11/04/2015 | 128 | USCA Case Number Case Appealed to Federal Circuit Case Number 16-1166 for 125 Notice of Appeal, filed by Icon Health & Fitness. (jmr) (Entered: 11/04/2015) |
| 11/12/2015 | 129 | TRANSCRIPT REQUEST FORM filed by Icon Health & Fitness for proceedings held on October 23, 2013 before Judge Robert J. Shelby, re 125 Notice of Appeal, (Attachments: # 1 Exhibit 1)(Braithwaite, Jared) (Entered: 11/12/2015) |

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|-----------------------------|
| PACER Service Center |
|-----------------------------|

| |
|----------------------------|
| Transaction Receipt |
|----------------------------|

A32

| | | | |
|----------------------------|------------------|-----------------------------|-----------------------|
| 12/16/2015 13:06:53 | | | |
| PACER Login: | mg5206:3818129:0 | Client Code: | |
| Description: | Docket Report | Search Criteria: | 1:11-cv-00166- RJS |
| Billable Pages: | 15 | Cost: | 1.50 |

(12) **United States Patent**
Hickman et al.

(10) **Patent No.:** **US 6,921,351 B1**
(45) **Date of Patent:** **Jul. 26, 2005**

(54) **METHOD AND APPARATUS FOR REMOTE INTERACTIVE EXERCISE AND HEALTH EQUIPMENT**

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(73) Assignee: **Cybergym, Inc.**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 547 days.

(21) Appl. No.: **10/045,619**

(22) Filed: **Oct. 19, 2001**

(51) **Int. Cl.**⁷ **A63B 21/00**

(52) **U.S. Cl.** **482/8; 482/4; 482/9; 482/901**

(58) **Field of Search** 482/1-9, 51, 54, 482/57, 900-902; 600/300, 520, 418; 607/2, 19, 32

(56) **References Cited**

U.S. PATENT DOCUMENTS

| | | | |
|----------------|---------|------------------|--------|
| 4,828,257 A | 5/1989 | Dyer et al. | |
| 4,860,763 A | 8/1989 | Schminke | |
| 5,313,942 A | 5/1994 | Platzker | |
| 5,385,520 A | 1/1995 | Lepine et al. | |
| 5,410,471 A | 4/1995 | Alyfuku et al. | |
| 5,410,472 A | 4/1995 | Anderson | |
| 5,474,090 A | 12/1995 | Begun et al. | |
| 5,512,025 A | 4/1996 | Dalebout et al. | |
| 5,591,104 A | 1/1997 | Andrus et al. | |
| 5,645,509 A | 7/1997 | Brewer et al. | |
| 5,702,323 A | 12/1997 | Poulton | |
| 5,779,596 A | 7/1998 | Weber | |
| 6,042,519 A | 3/2000 | Shea | |
| 6,053,844 A | 4/2000 | Clem | |
| 6,059,692 A * | 5/2000 | Hickman | 482/8 |
| 6,171,218 B1 | 1/2001 | Shea | |
| 6,312,363 B1 | 11/2001 | Watterson et al. | |
| 6,458,060 B1 * | 10/2002 | Watterson et al. | 482/54 |

OTHER PUBLICATIONS

Winkler, William J.; "Pumping Iron with a Digital Friend"; *Business Week*, Dec. 18, 1995, p. 78A.

Winkler, William J., "Pumping Iron With a Digital Friend", *Business Week*, Dec. 18, 1995, pp. 78a.

Internet Archive Wayback Machine, archive for www.ifit.com, at http://web.archive.org/web/*/www.ifit.com, Sep. 1, 2003, 1 pg.

iFIT.com "Internet workouts control your treadmill, bike, or elliptical", at <http://www.ifit.com>, Sep. 1, 2003, 3 pgs.

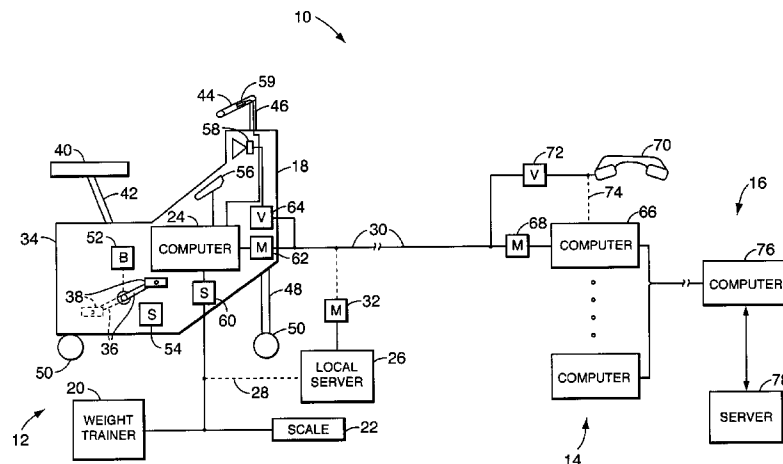
* cited by examiner

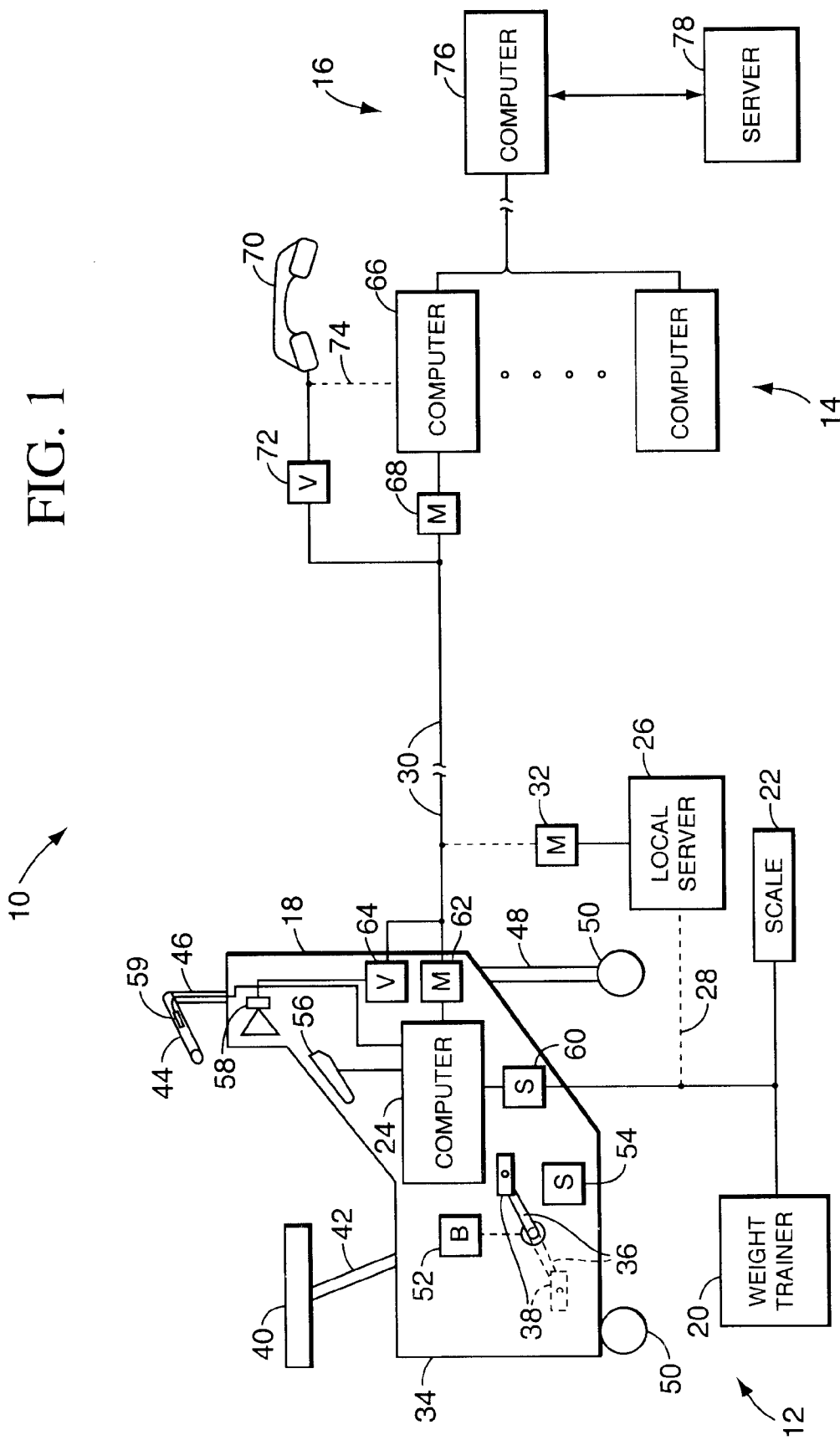
Primary Examiner—Glenn E. Richmon

(57) **ABSTRACT**

An exercise system includes a local system having an exercise apparatus and an associated local computer, where the local computer controls and monitors the operation and use, respectively, of the exercise apparatus. The system further includes a remote system having a remote computer, and a transmission medium preferably including the Internet that couples the local system to the remote system for data communication between the local system and the remote system. The remote system may receive local system data from the local system concerning the use of the exercise apparatus, and the local system may receive remote system data from the remote system concerning the operation of the exercise apparatus. The local computer preferably controls the operation of the exercise apparatus based upon a modifiable script stored in a read/write memory of the local computer, which can be updated by the remote system. A method for controlling an exercise apparatus includes running a modifiable script on a local computer to control the use and to monitor the operation of an exercise apparatus, and communicating with a remote system, preferably via the Internet, to provide the remote system with data concerning the use of the exercise apparatus. The script is stored in read/write memory of the local computer and remote system data received from the remote system may include at least a portion of a new script to be stored in the read/write memory of the local computer.

20 Claims, 32 Drawing Sheets





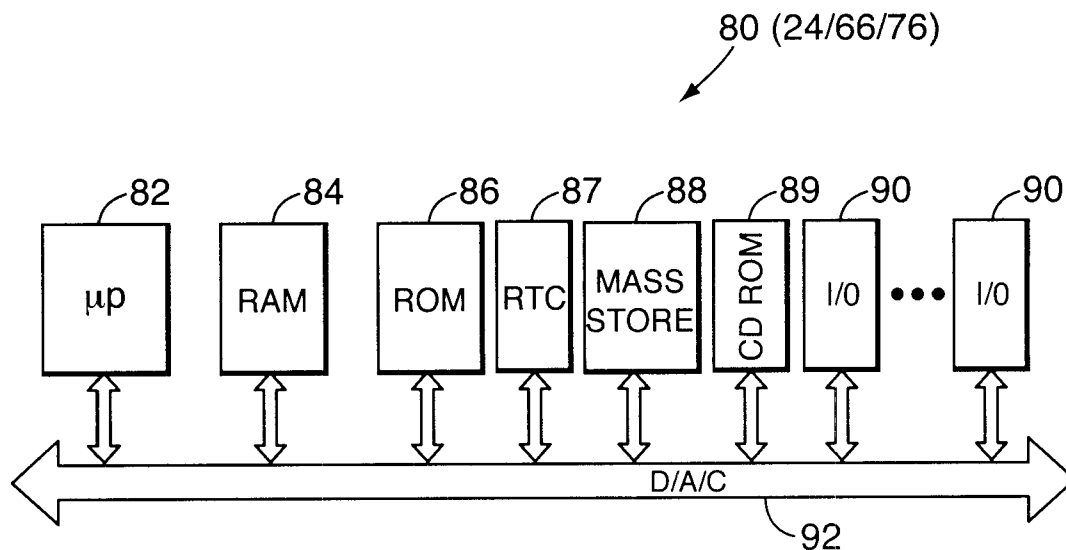


FIG. 2

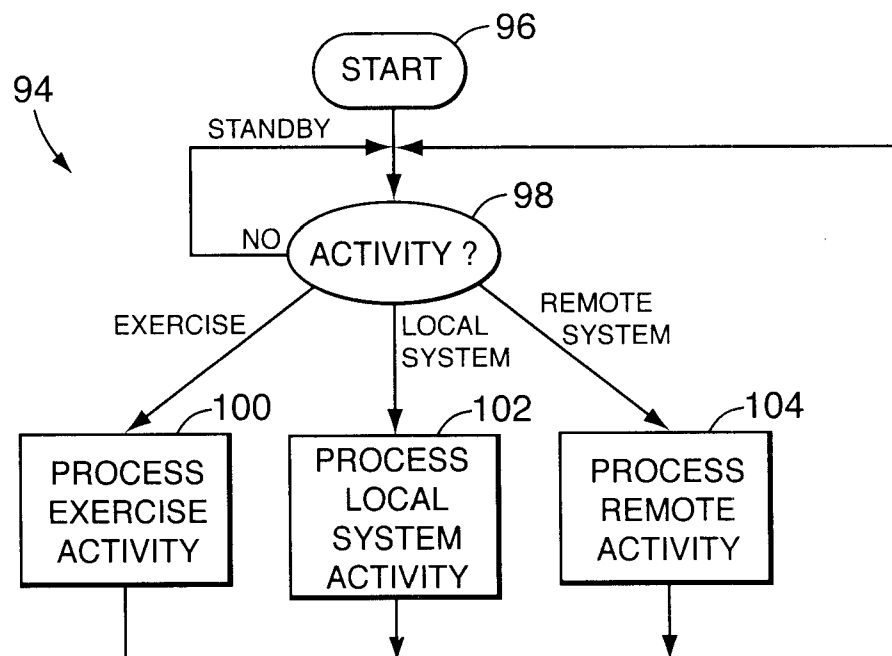


FIG. 3

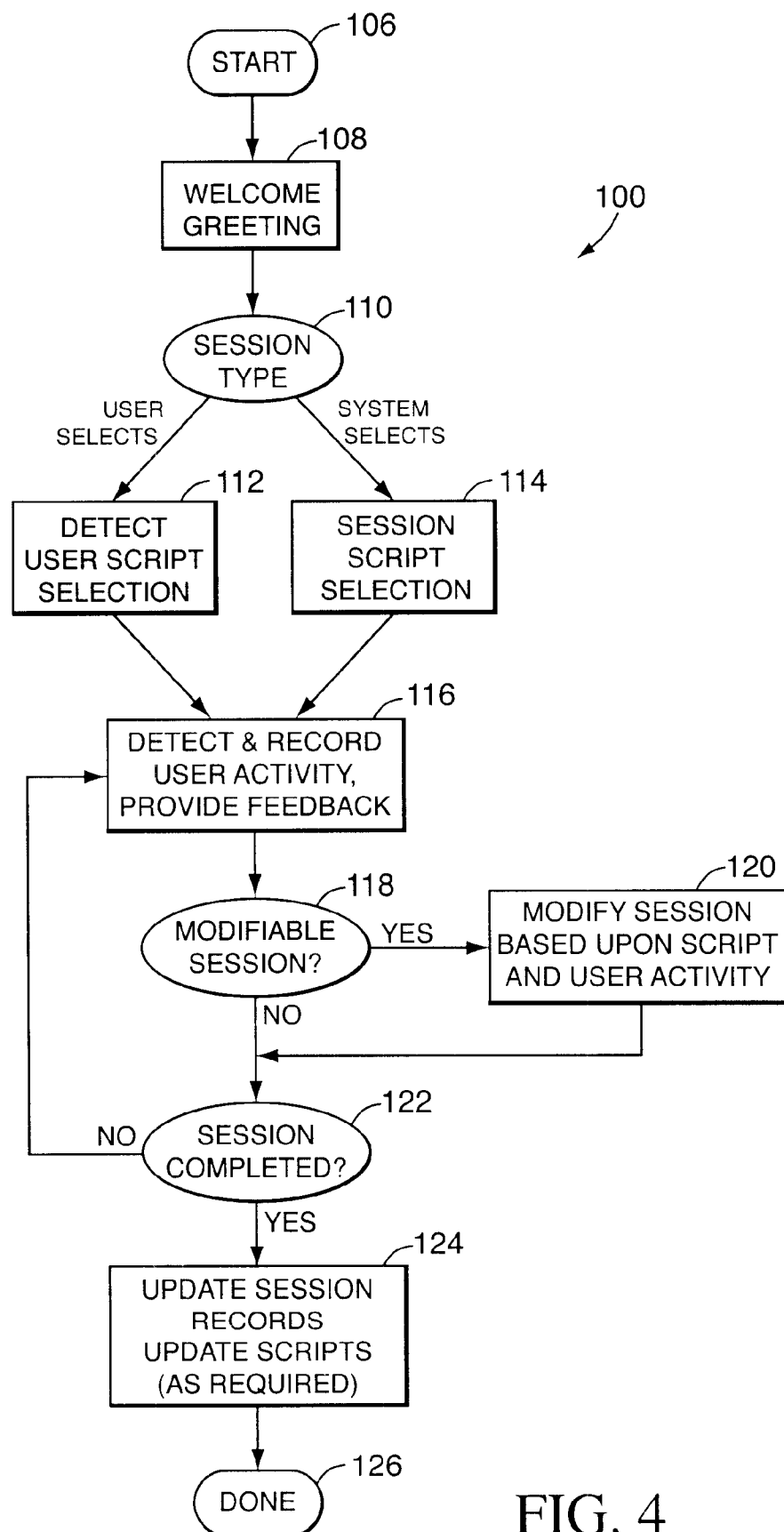


FIG. 4

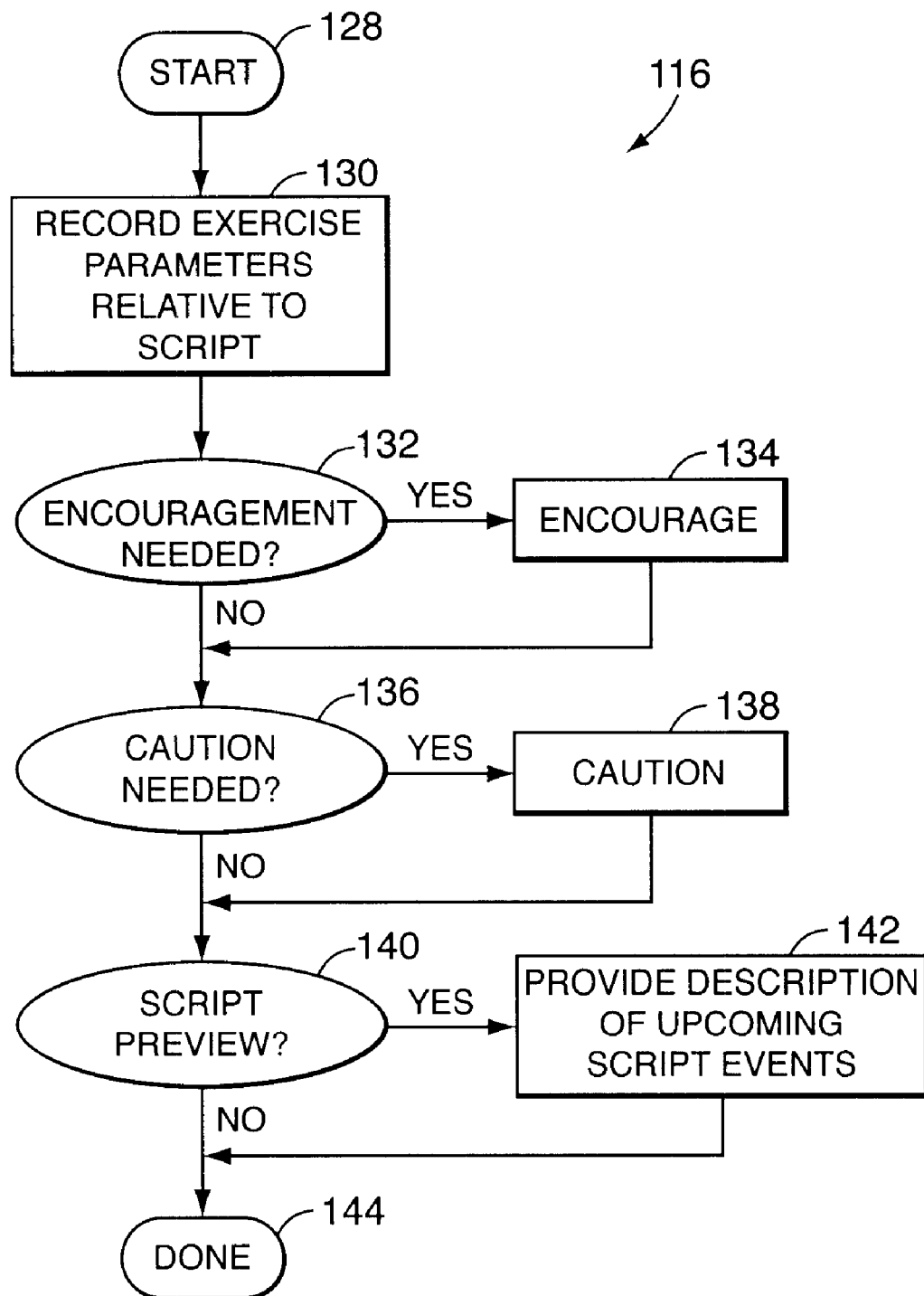


FIG. 5

FIG. 6

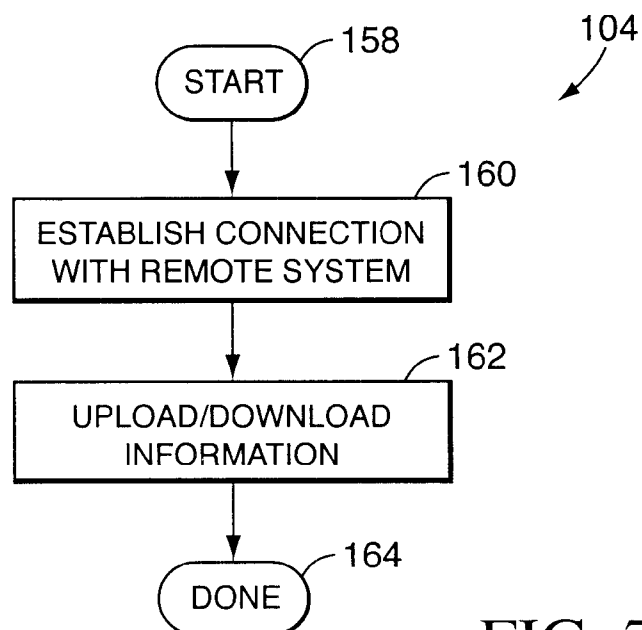
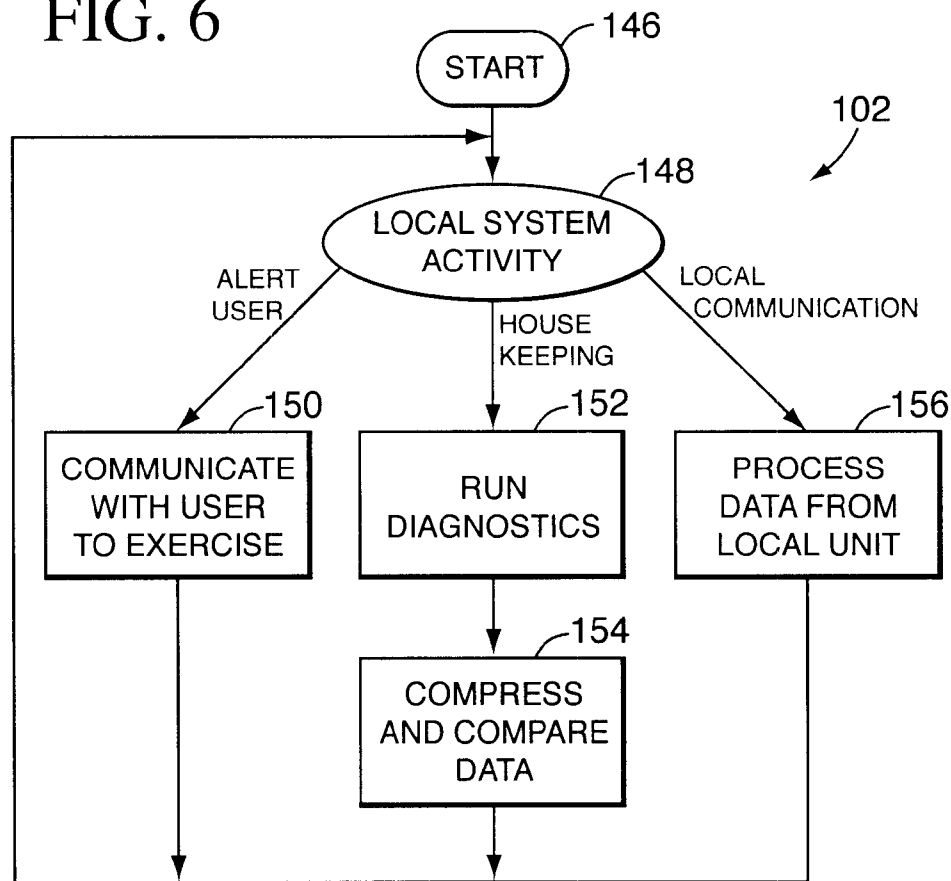


FIG. 7

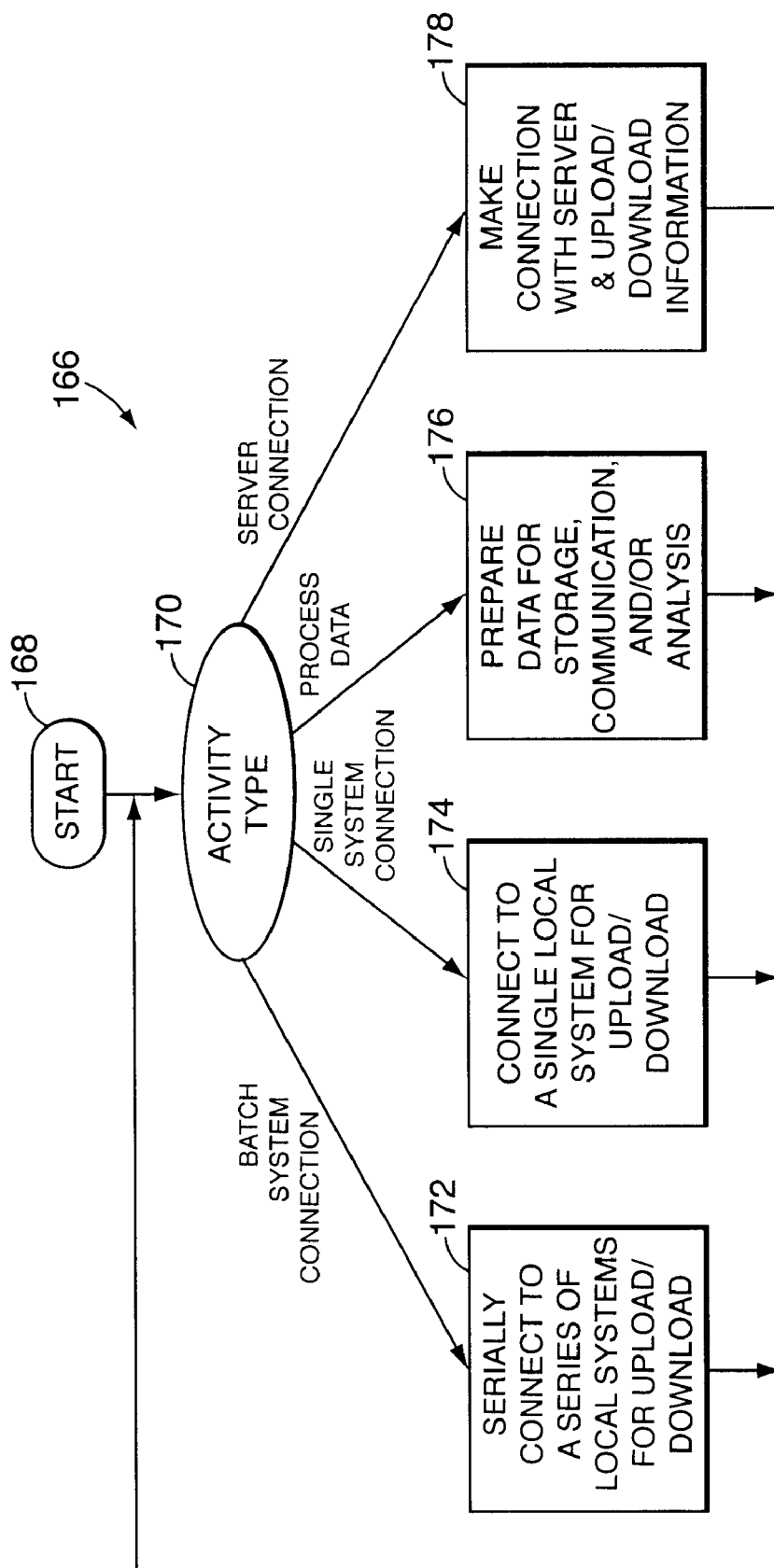


FIG. 8

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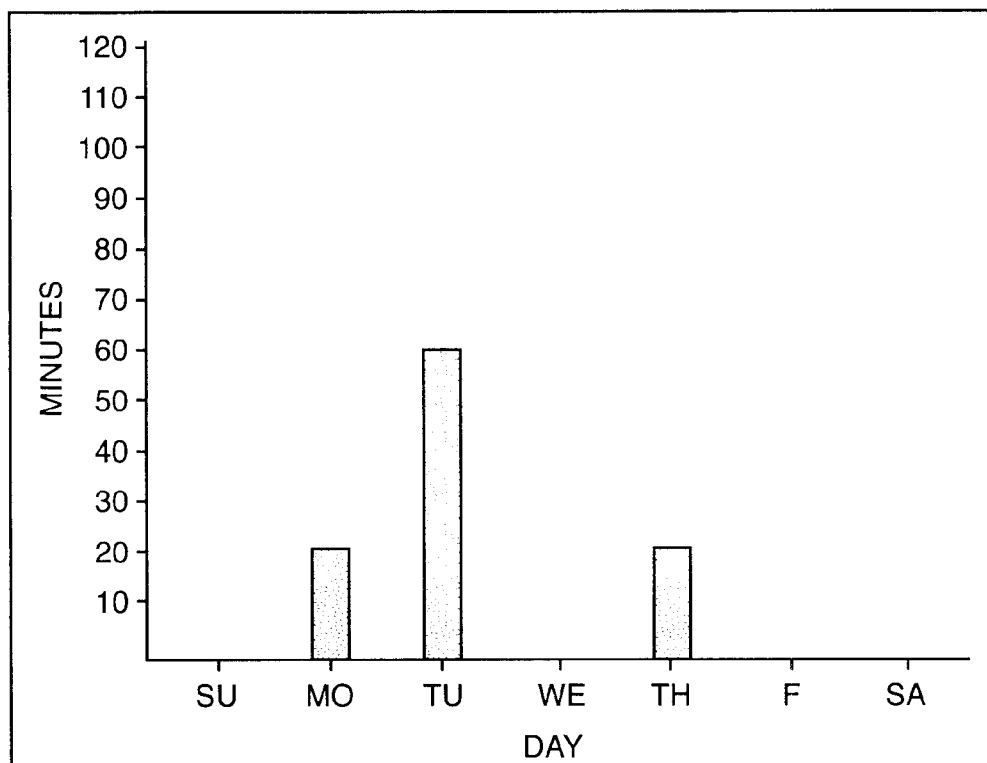


FIG. 8A

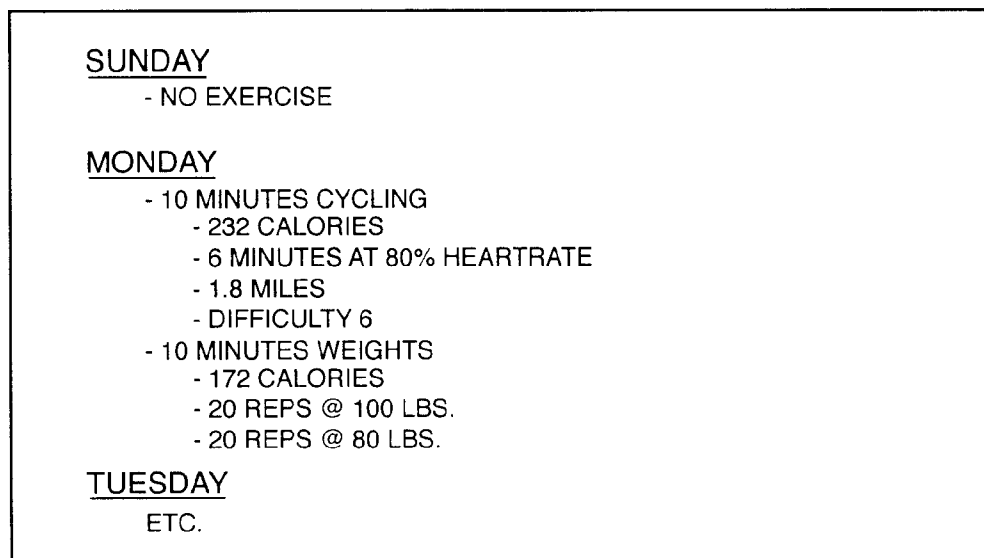


FIG. 8B

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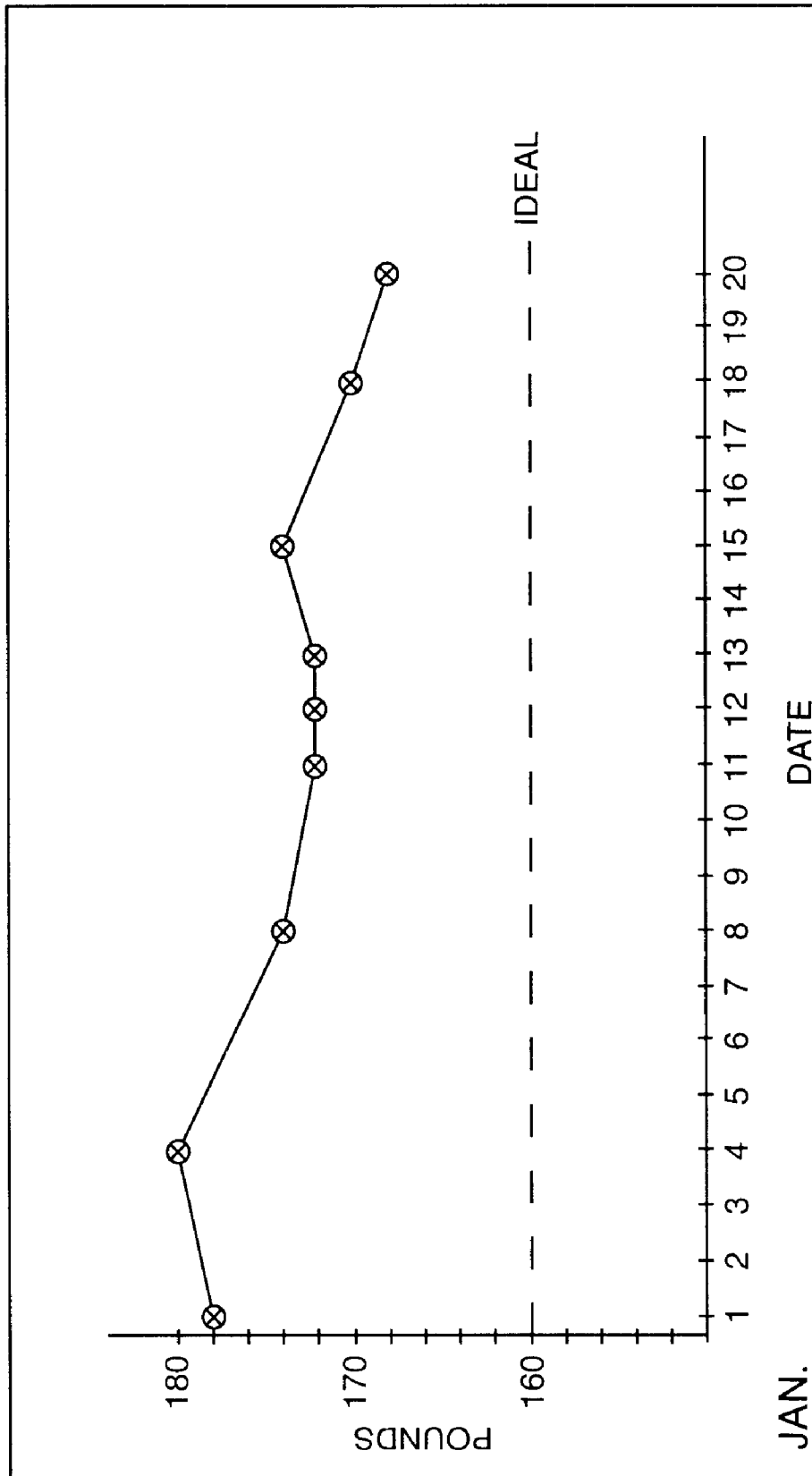


FIG. 8C

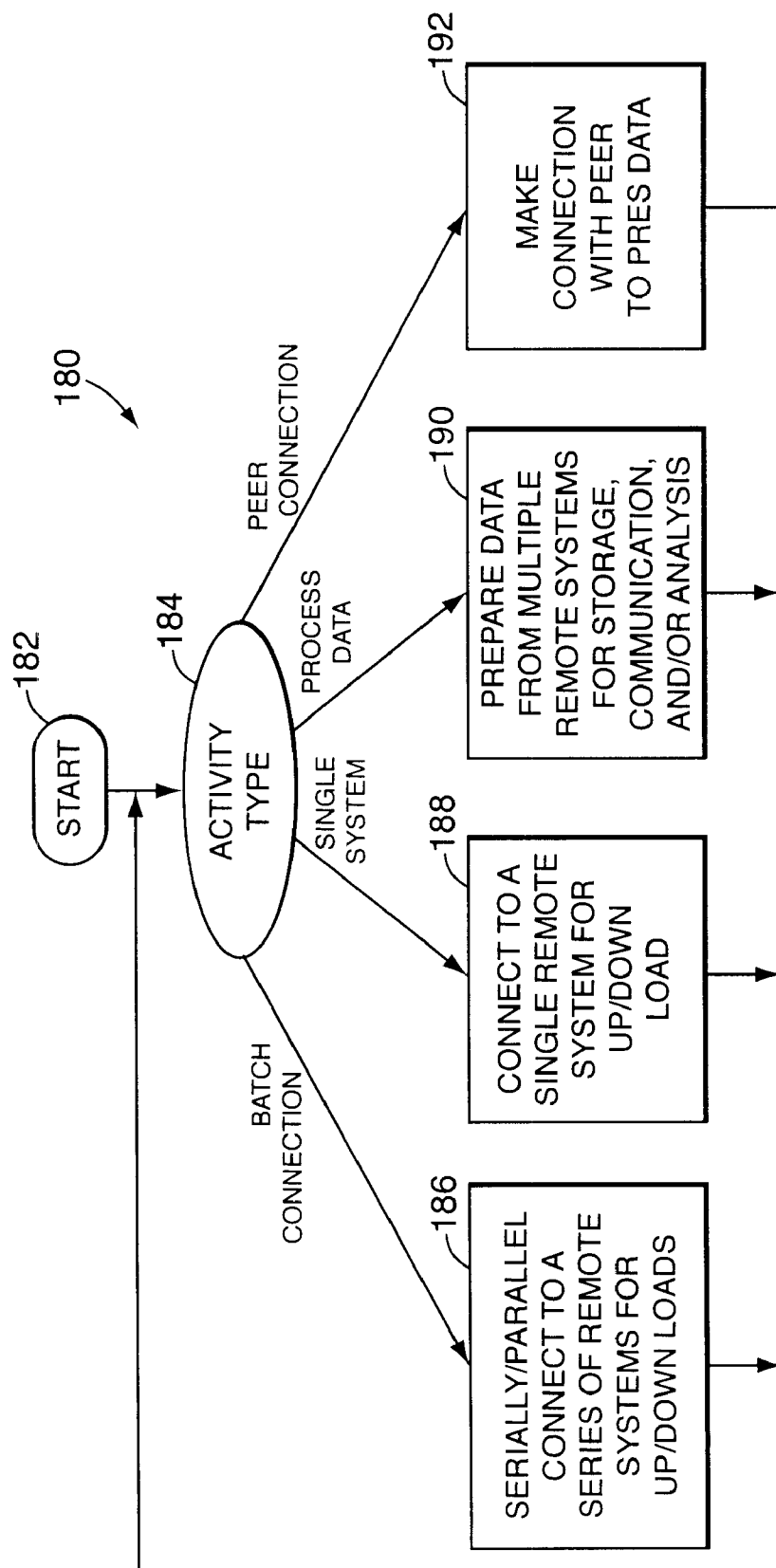


FIG. 9

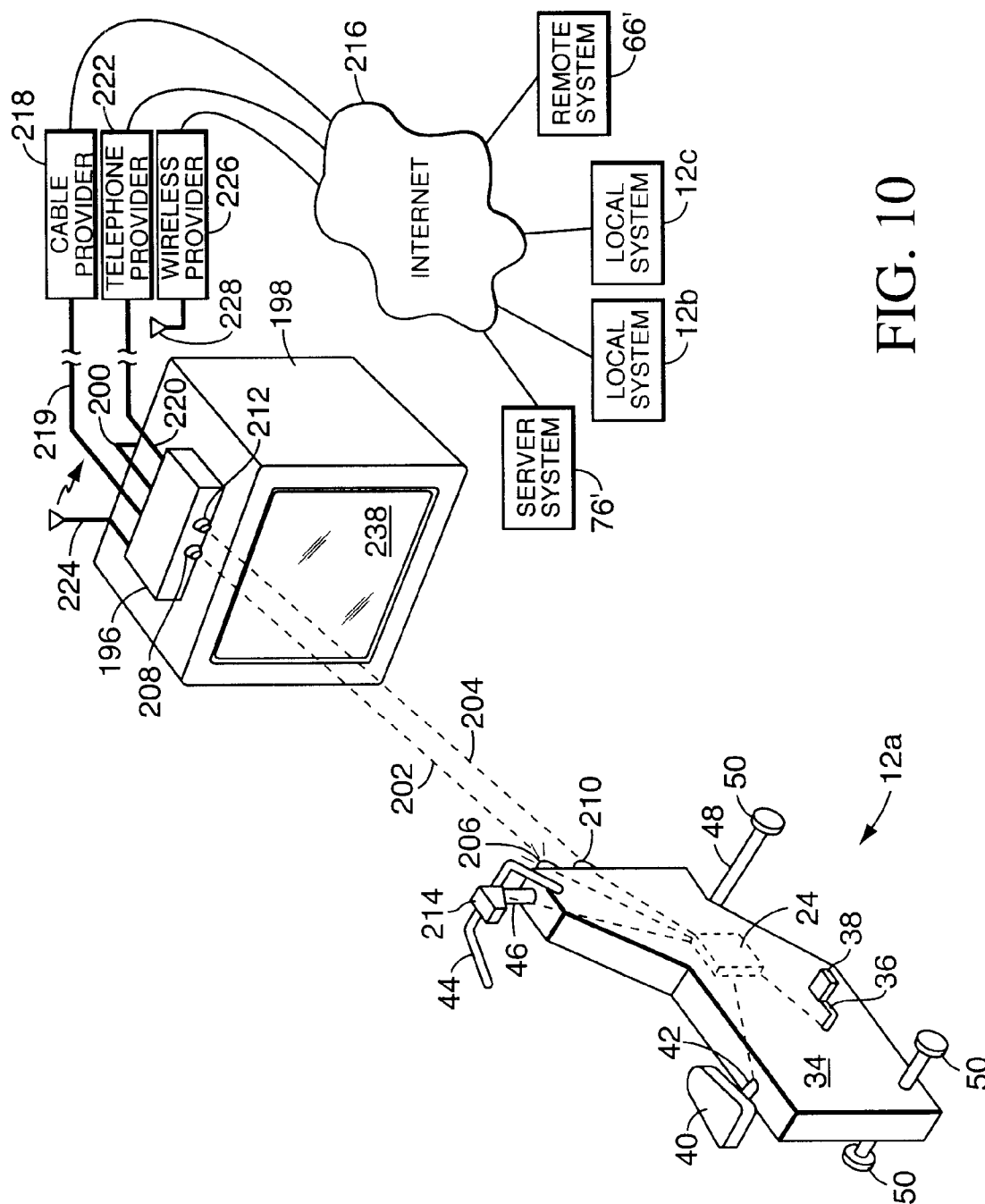


FIG. 10

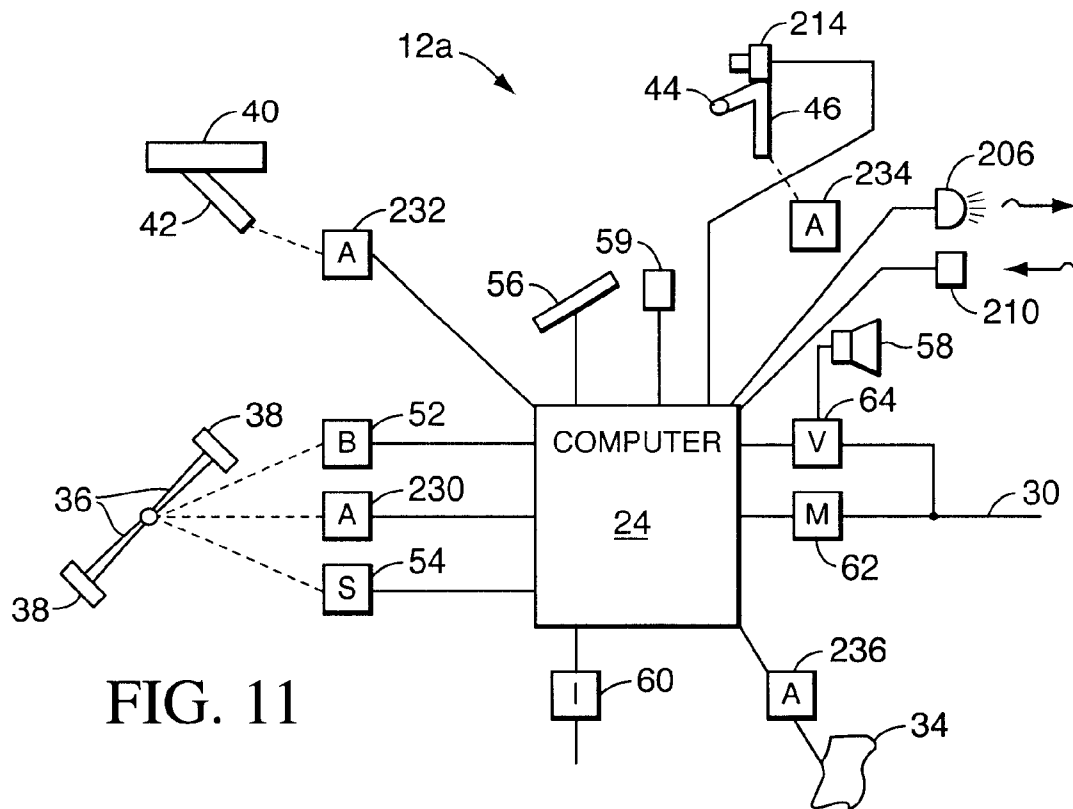
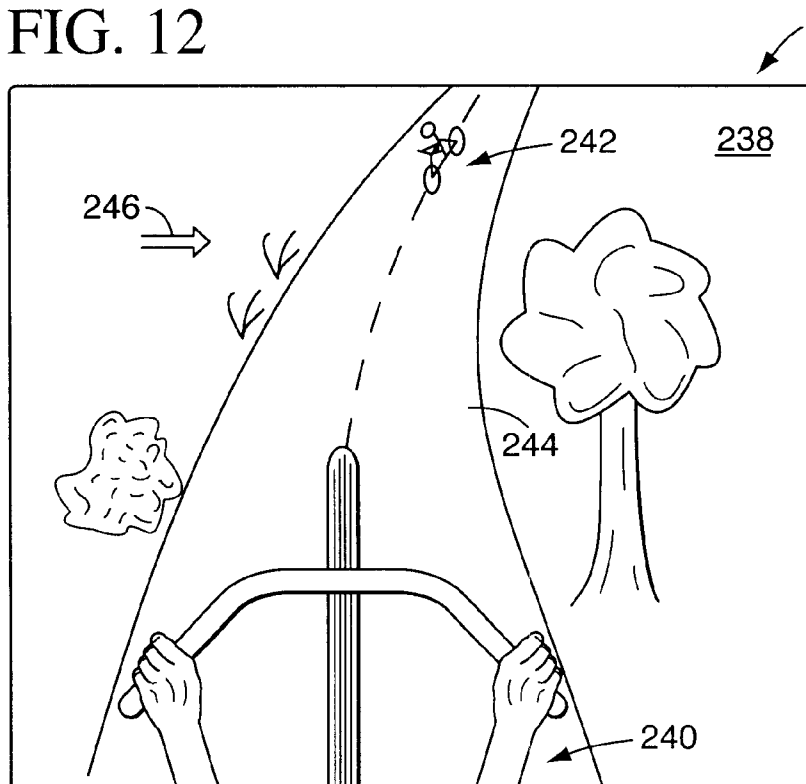


FIG. 12



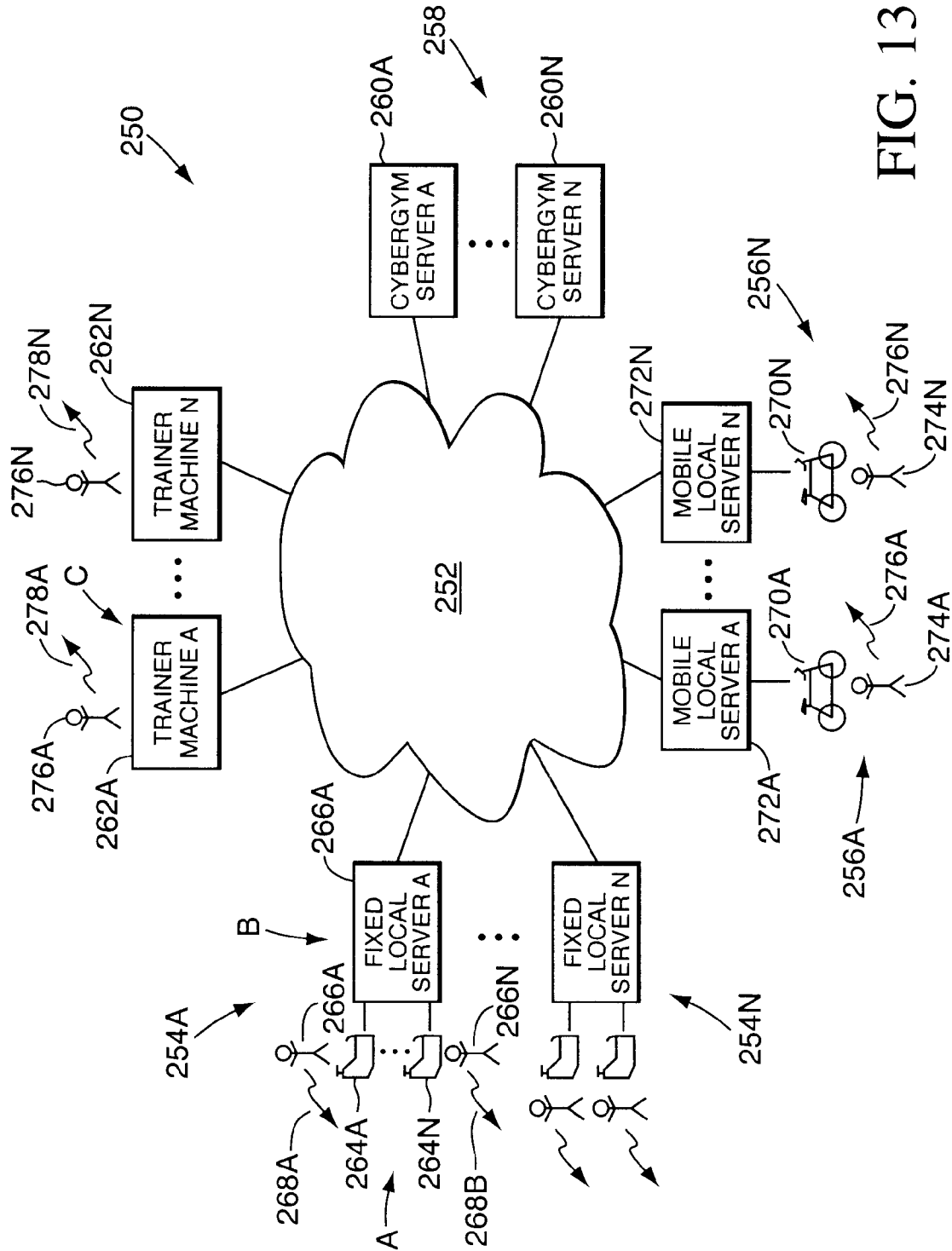


FIG. 13

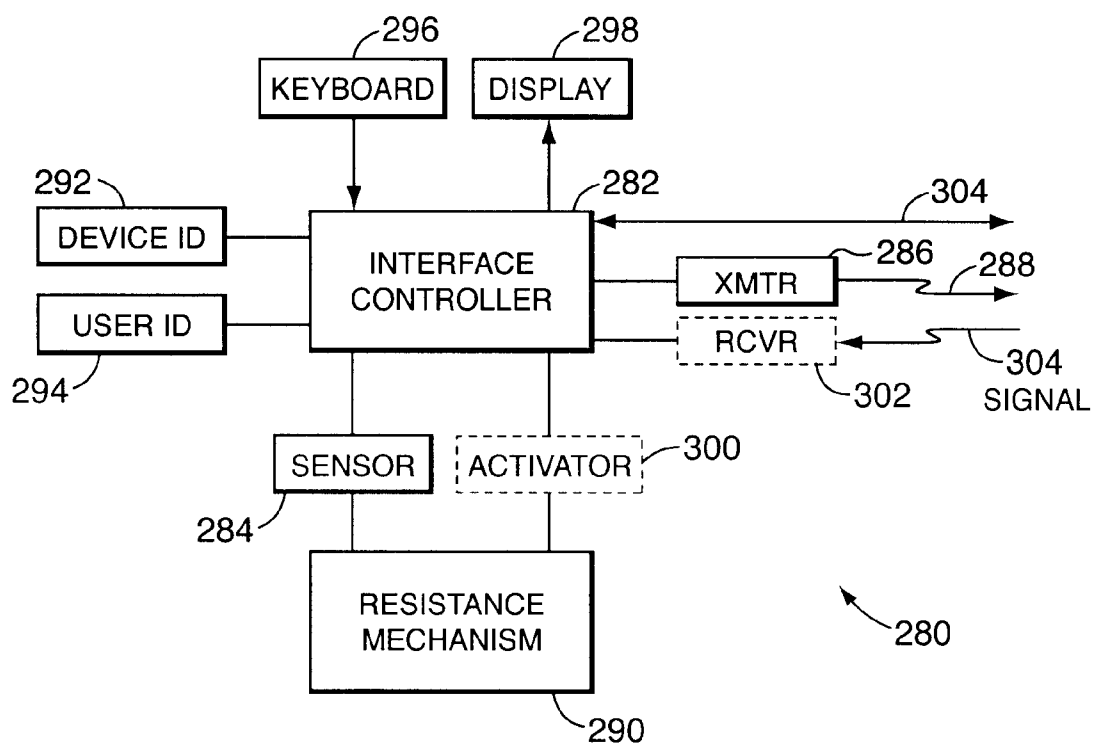


FIG. 14

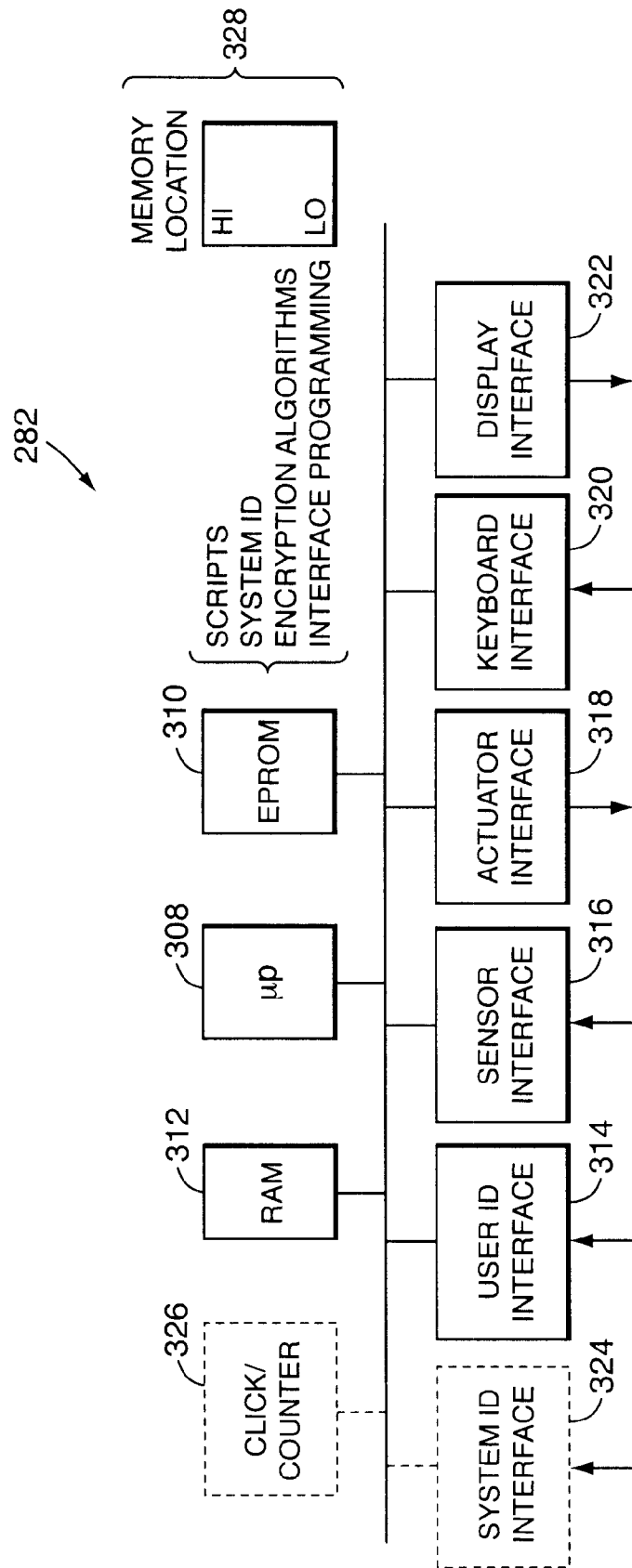


FIG. 15

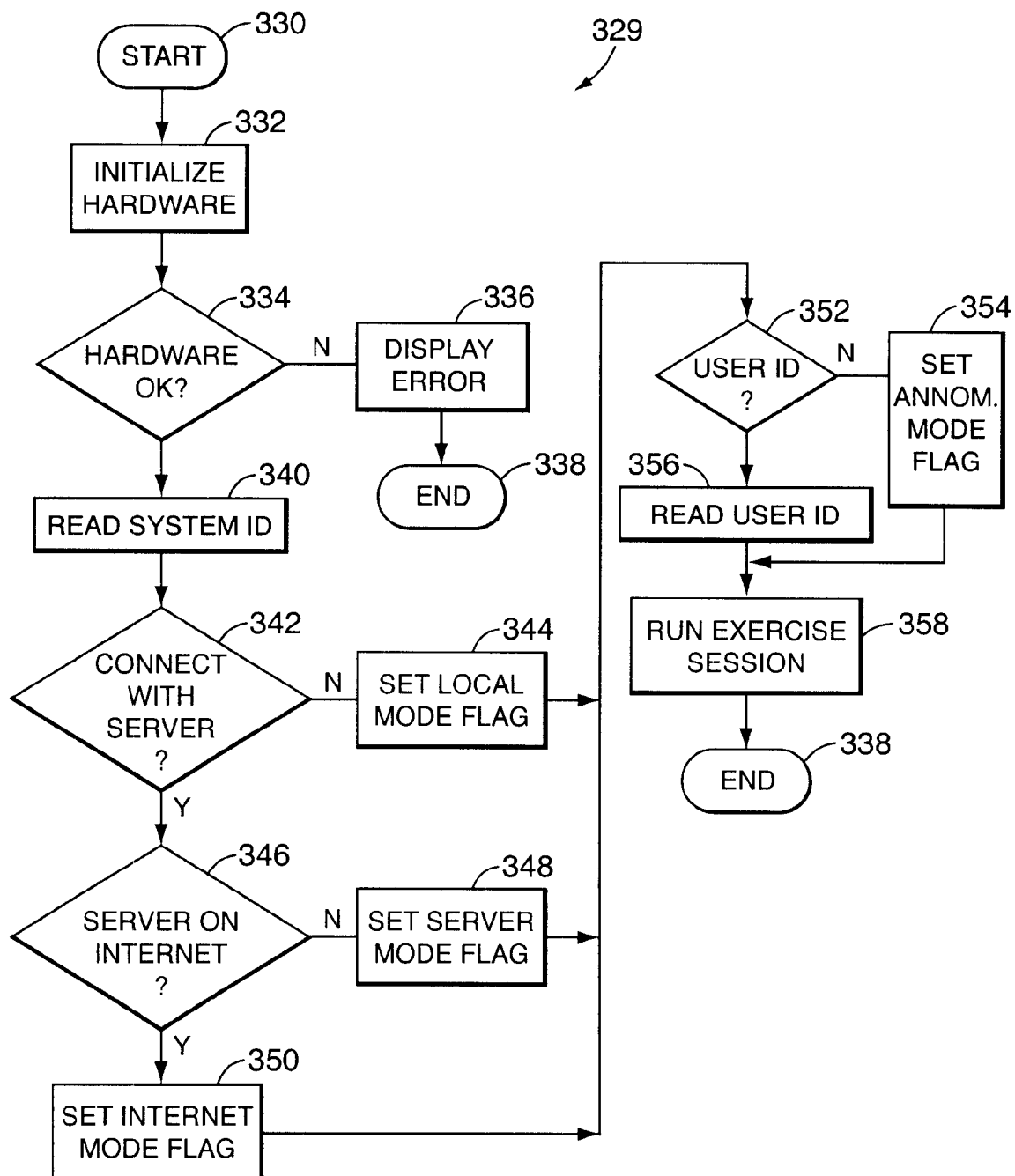


FIG. 16

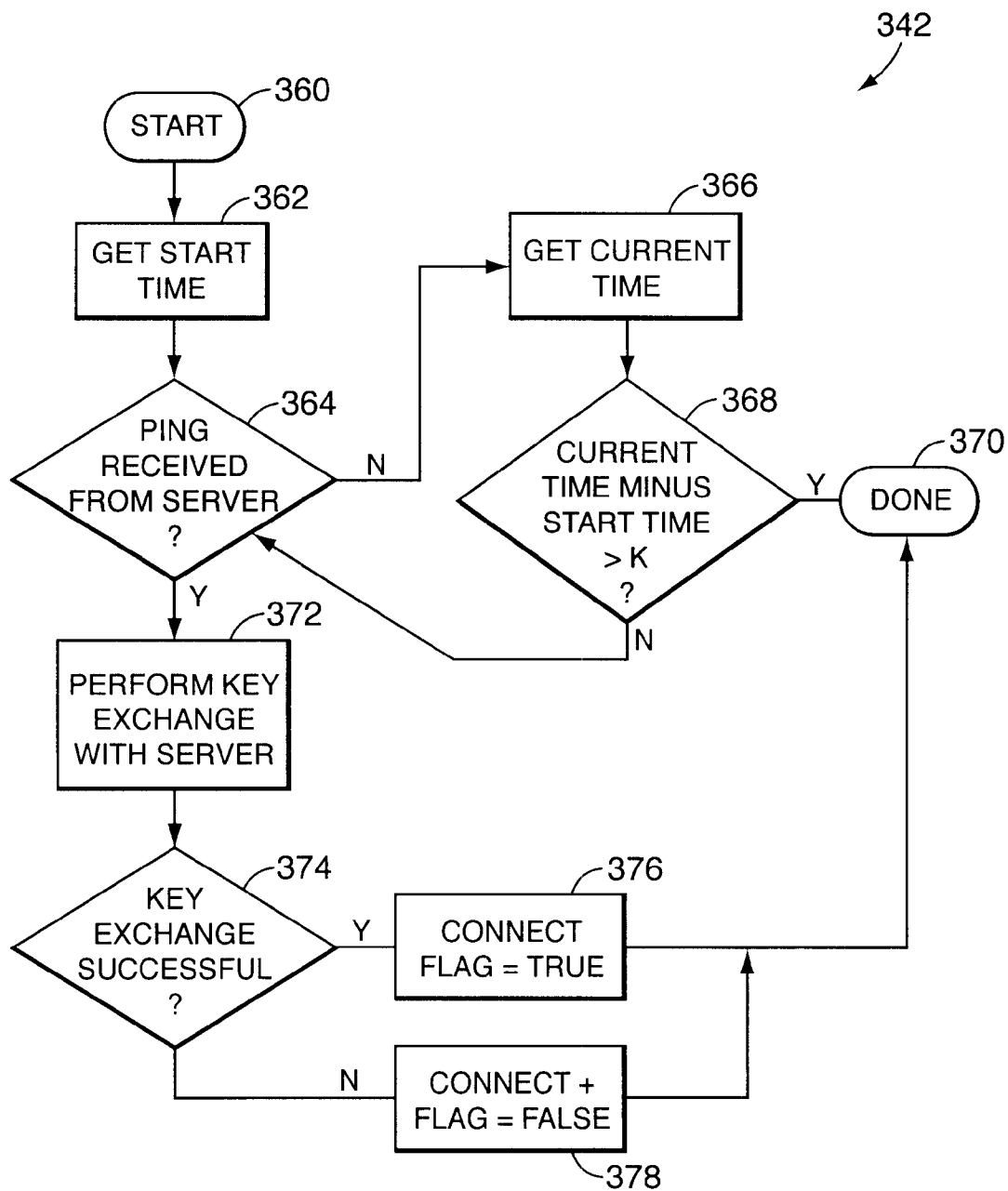


FIG. 17

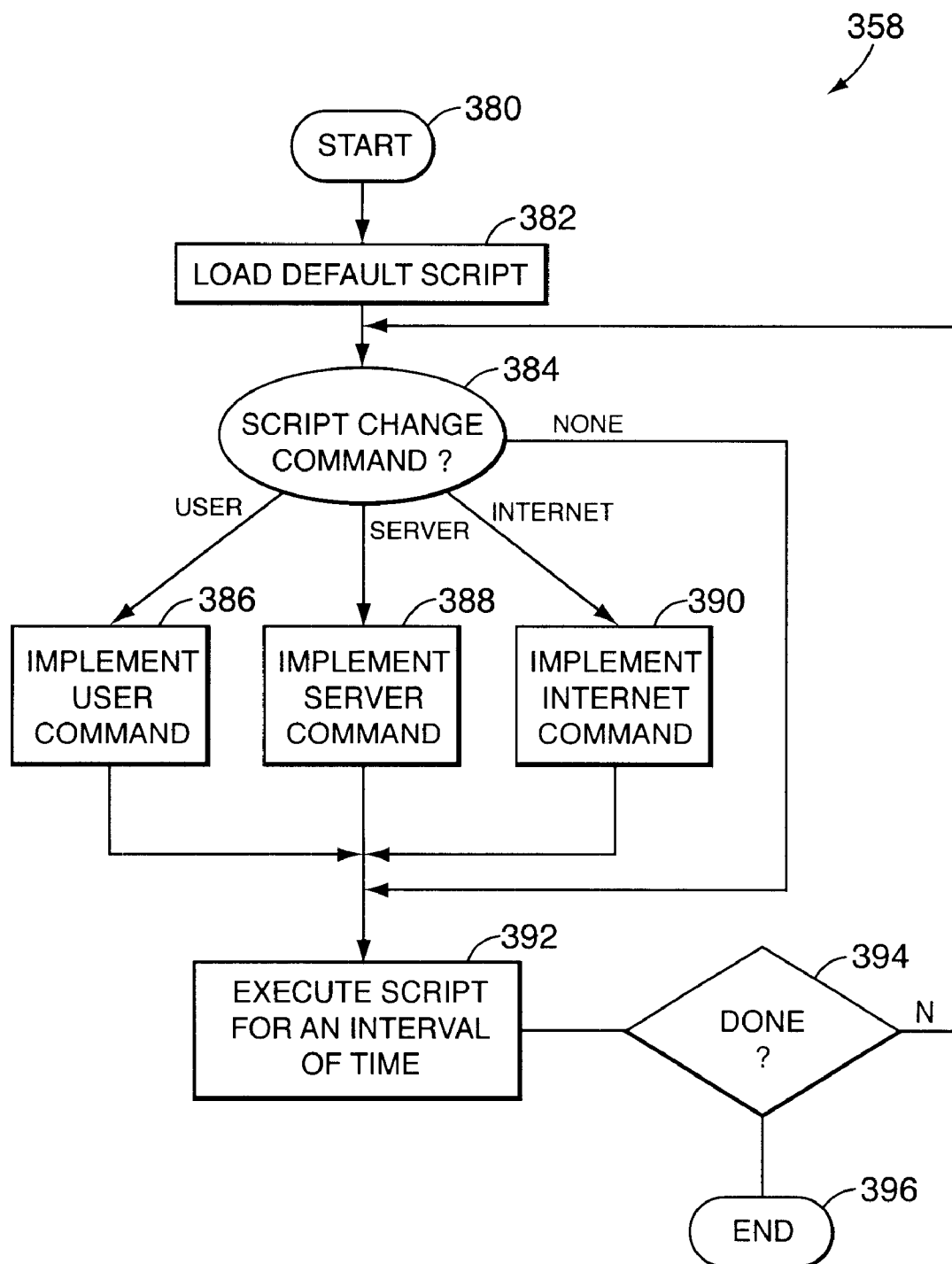


FIG. 18

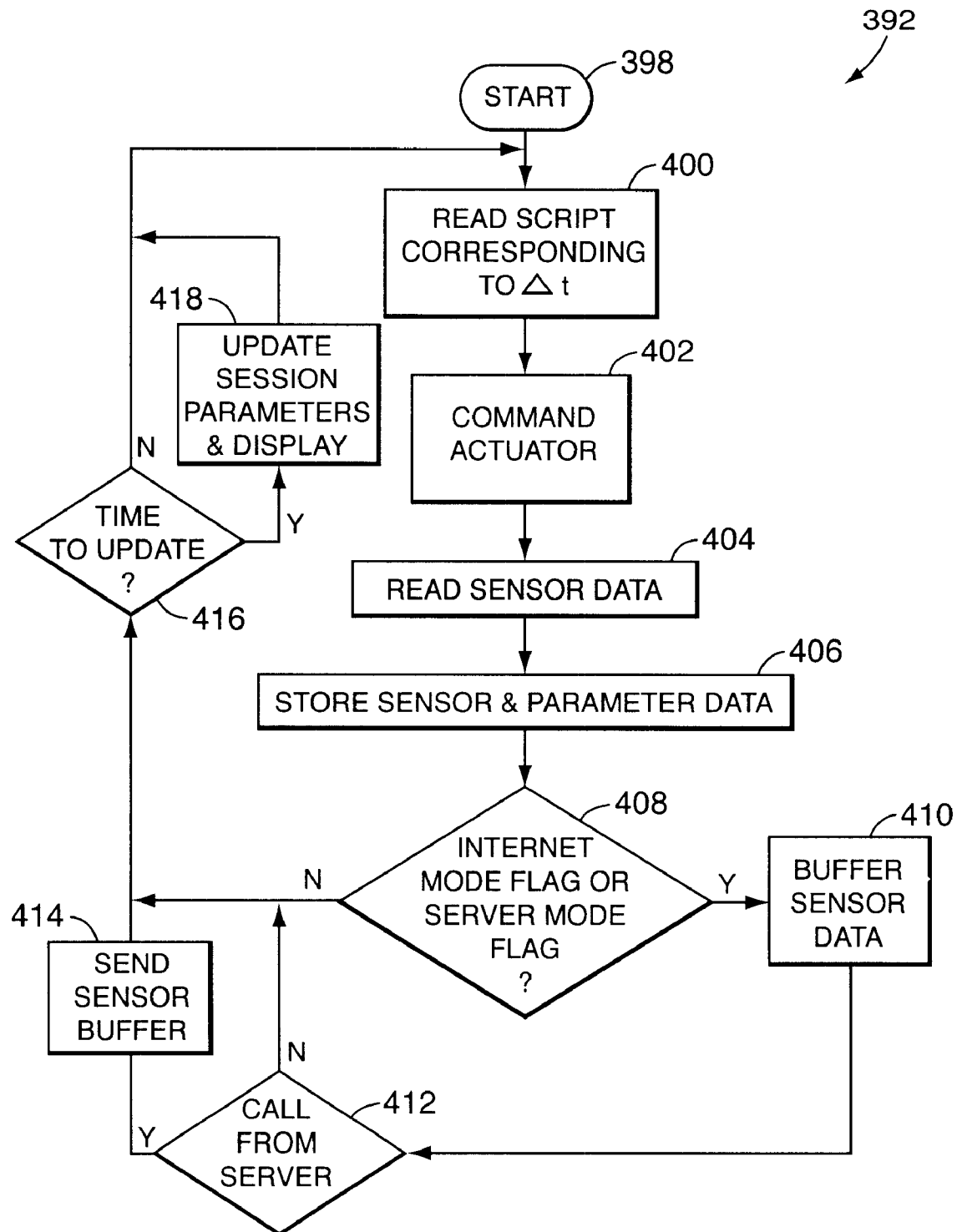


FIG. 19

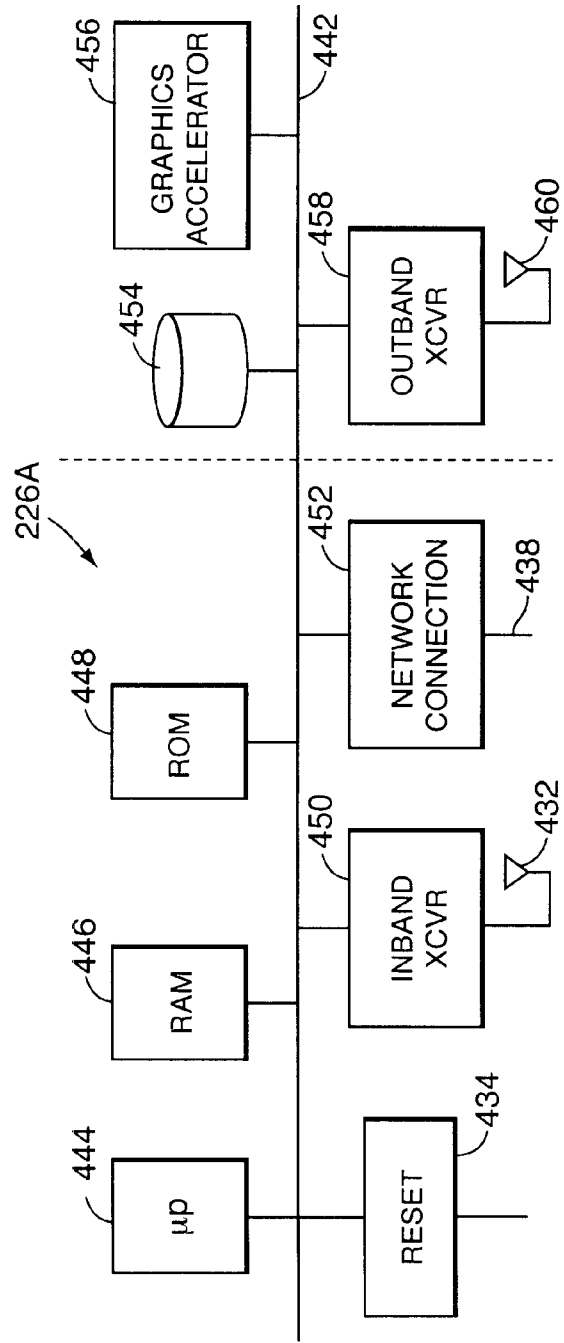
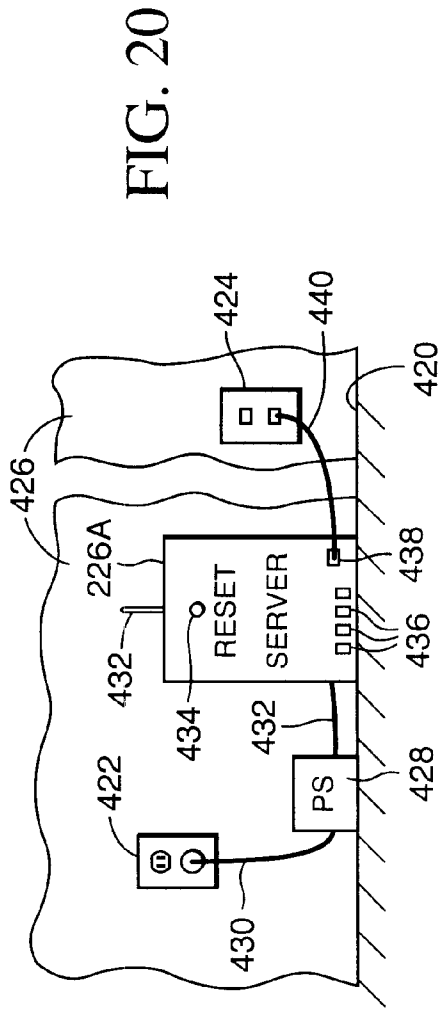


FIG. 22

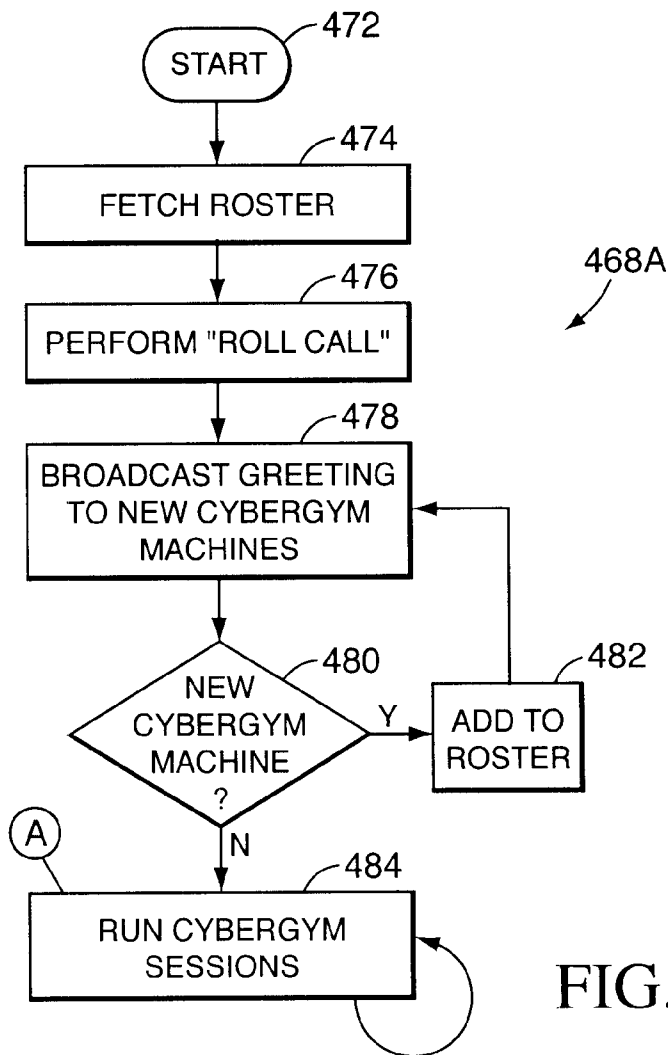
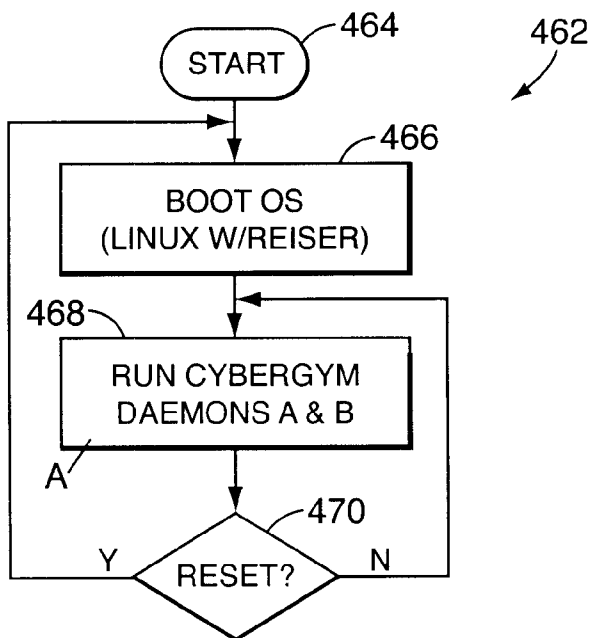


FIG. 23

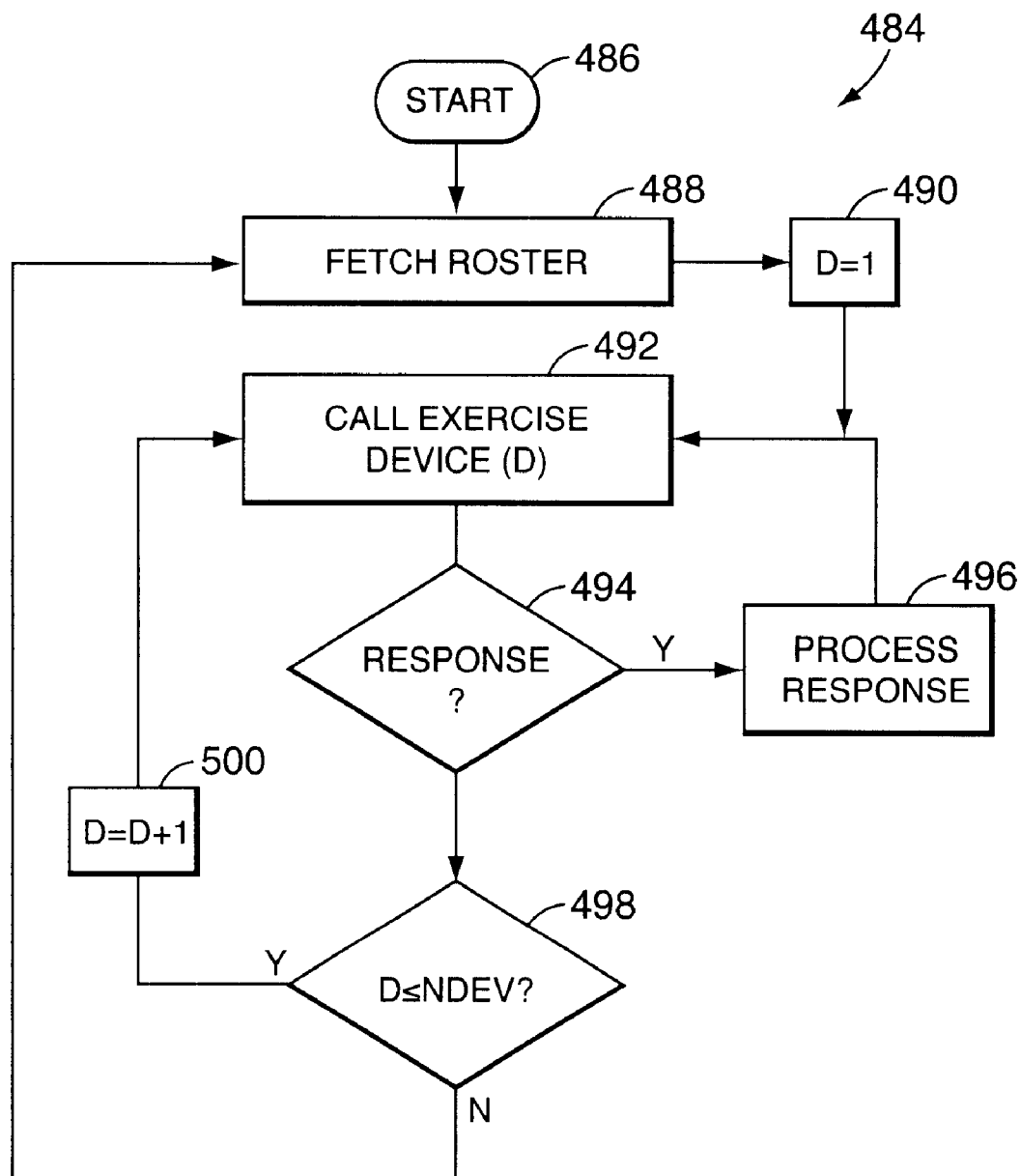


FIG. 24

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FIG. 25

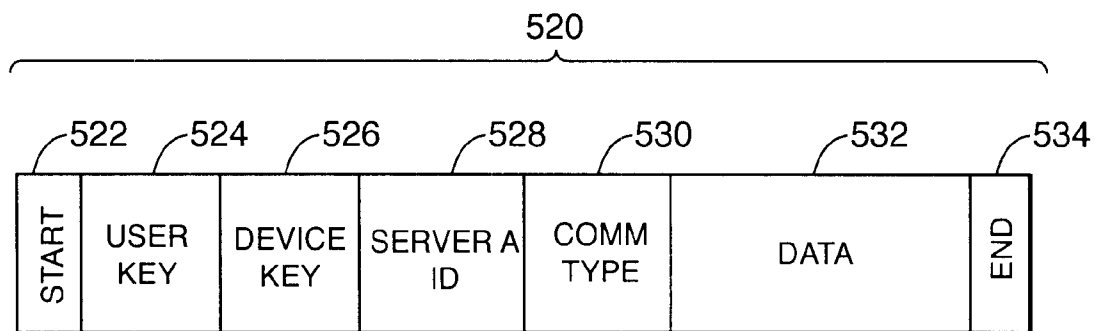
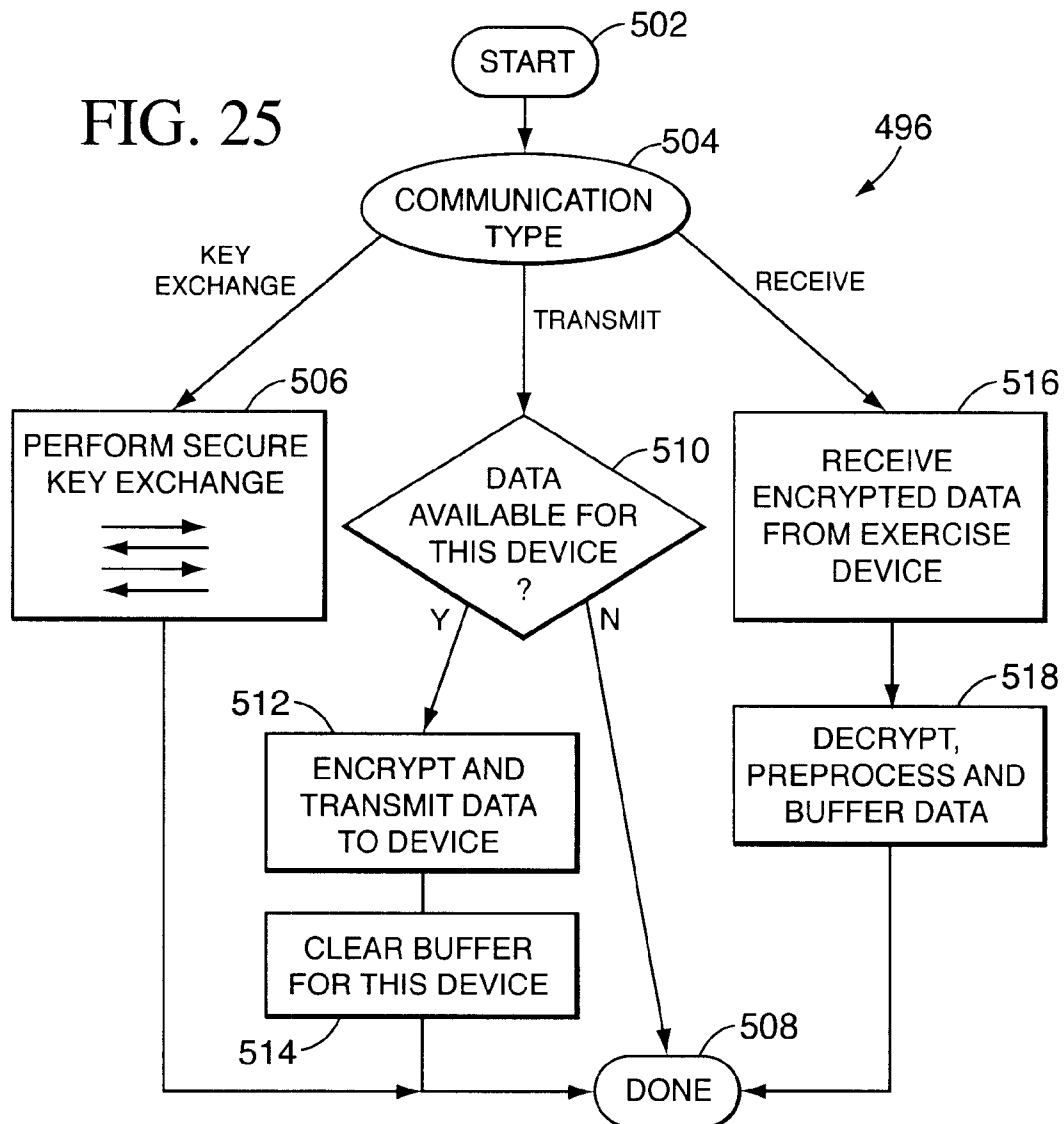


FIG. 25A

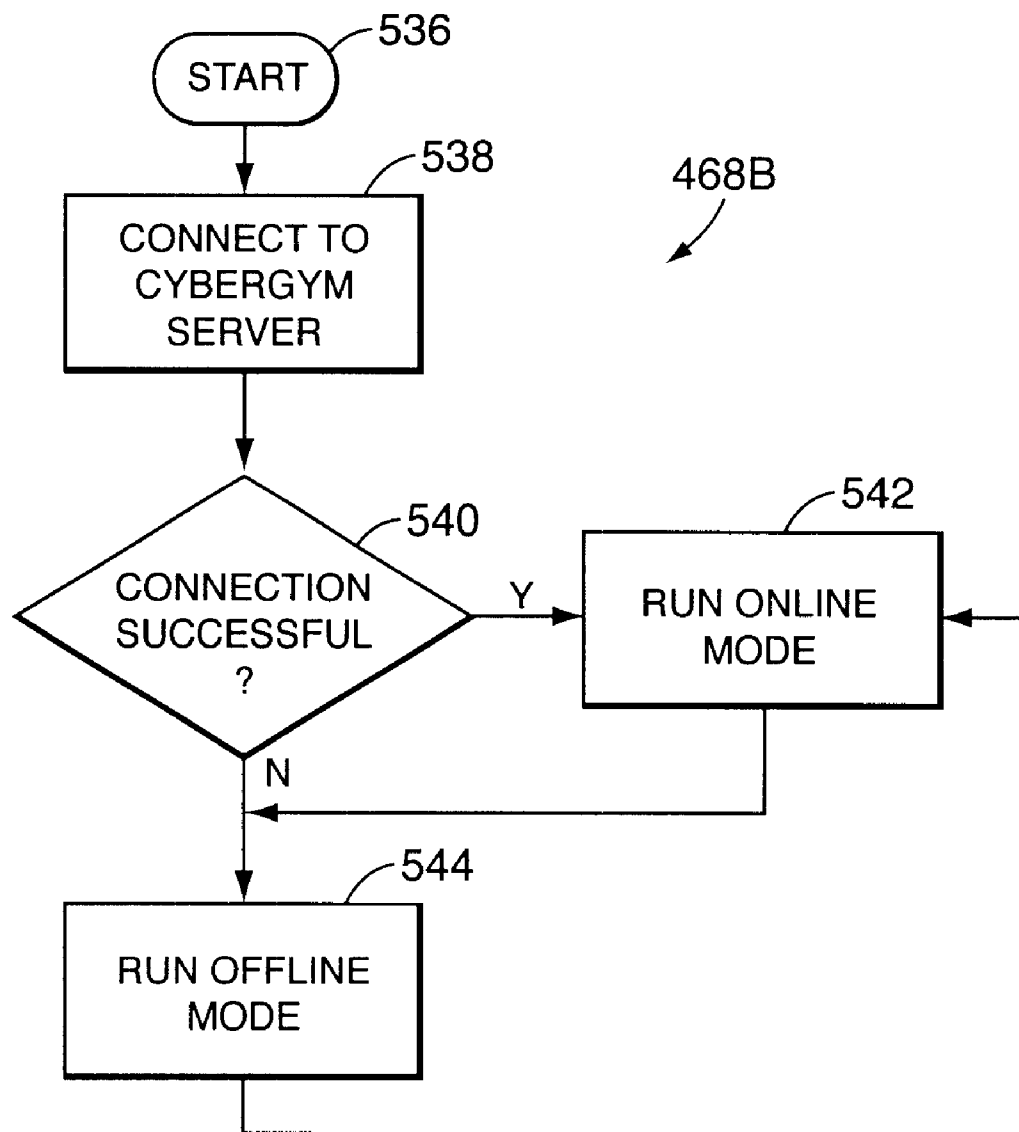


FIG. 26

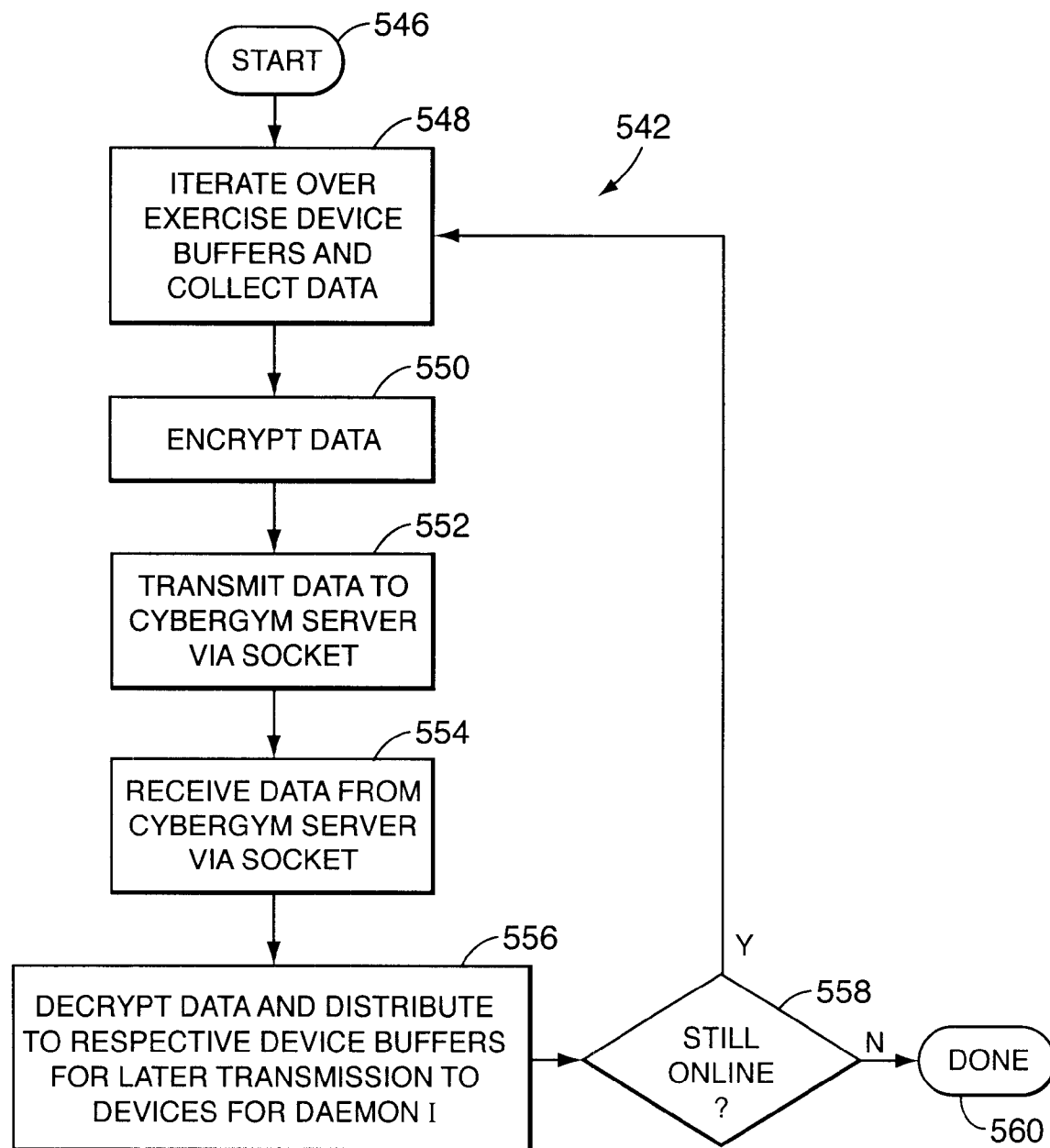


FIG. 27

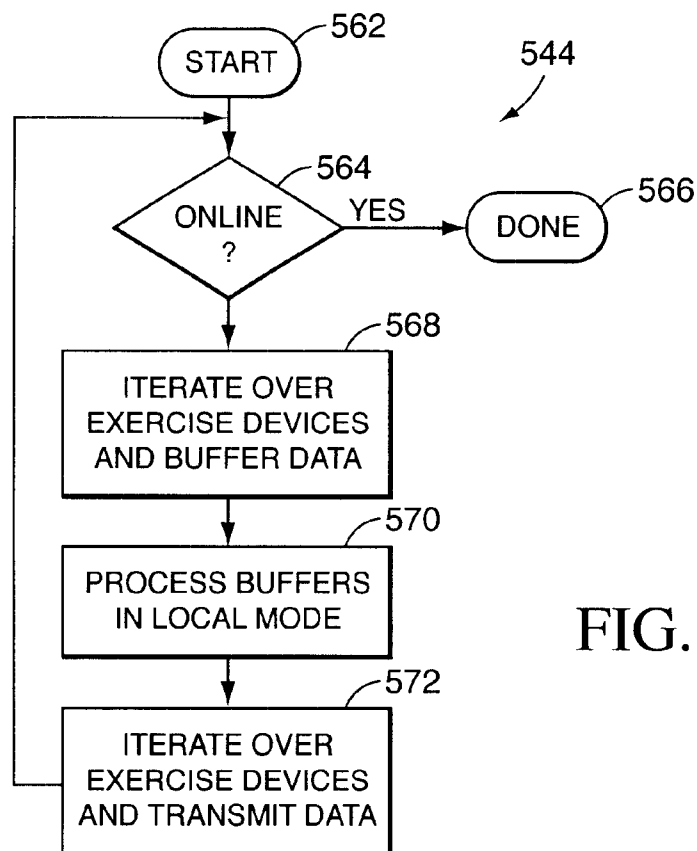


FIG. 28

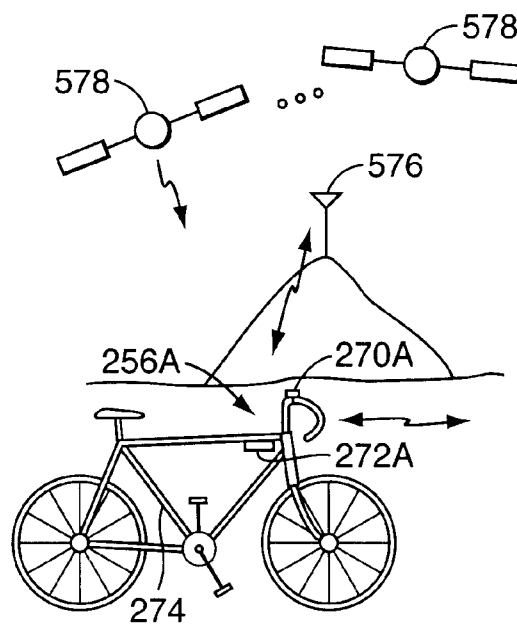


FIG. 29

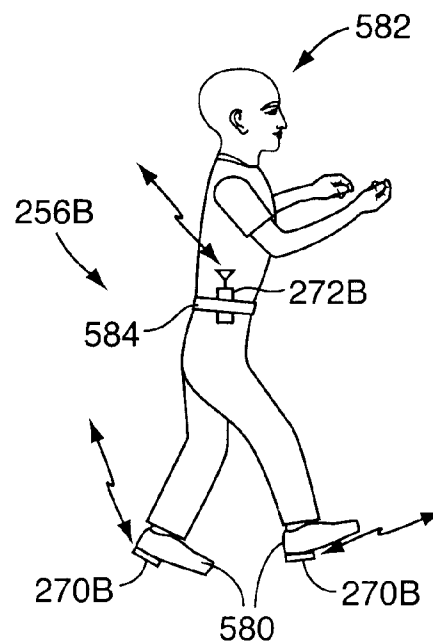


FIG. 30

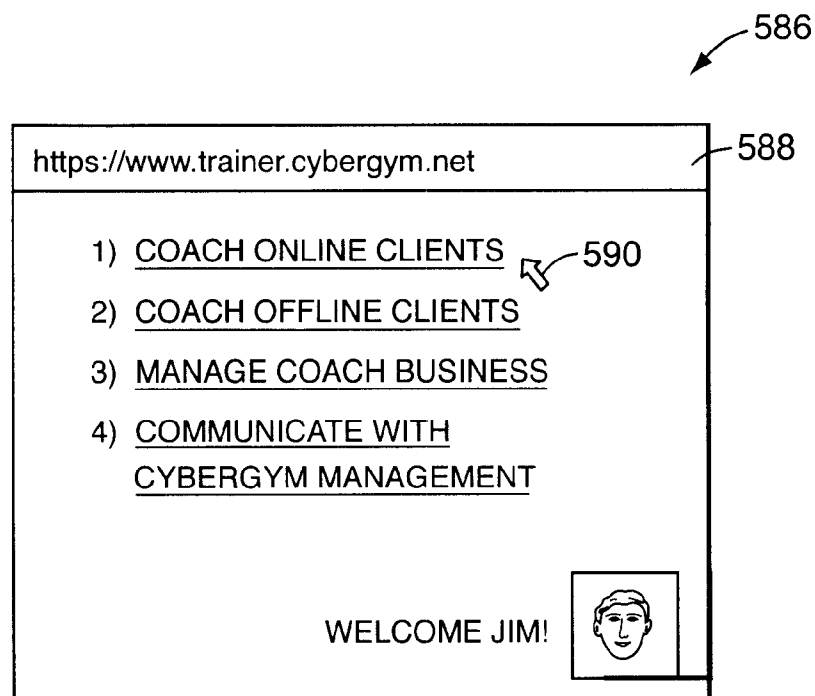


FIG. 31

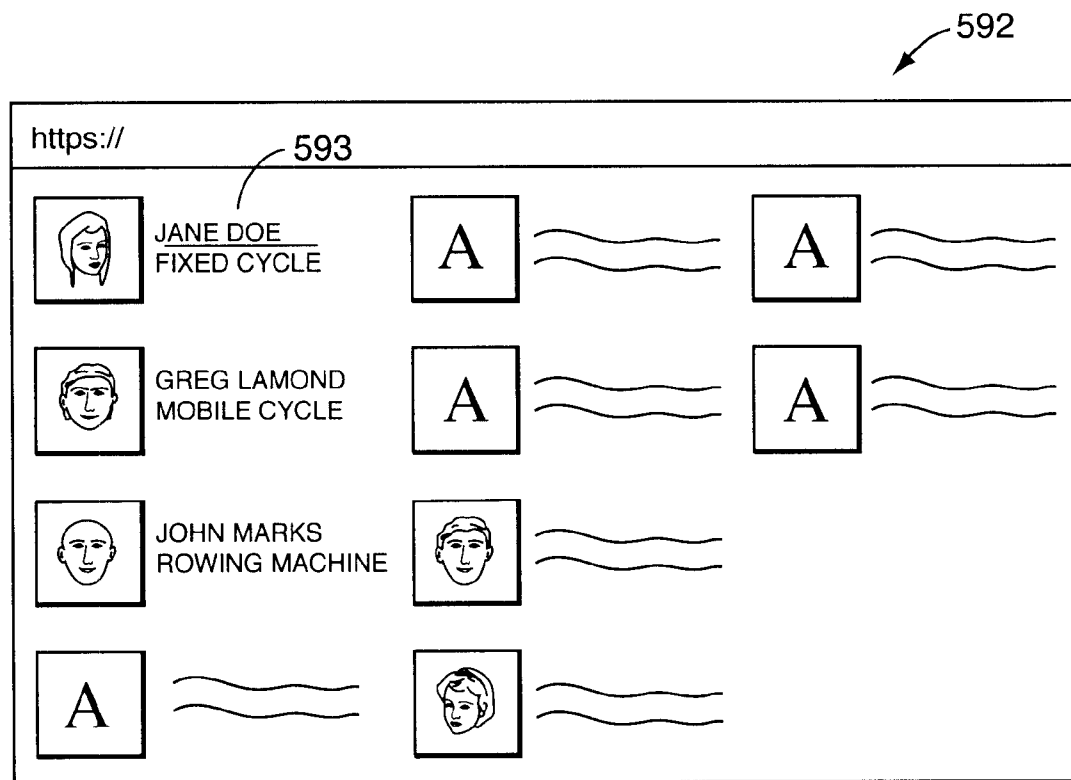


FIG. 32

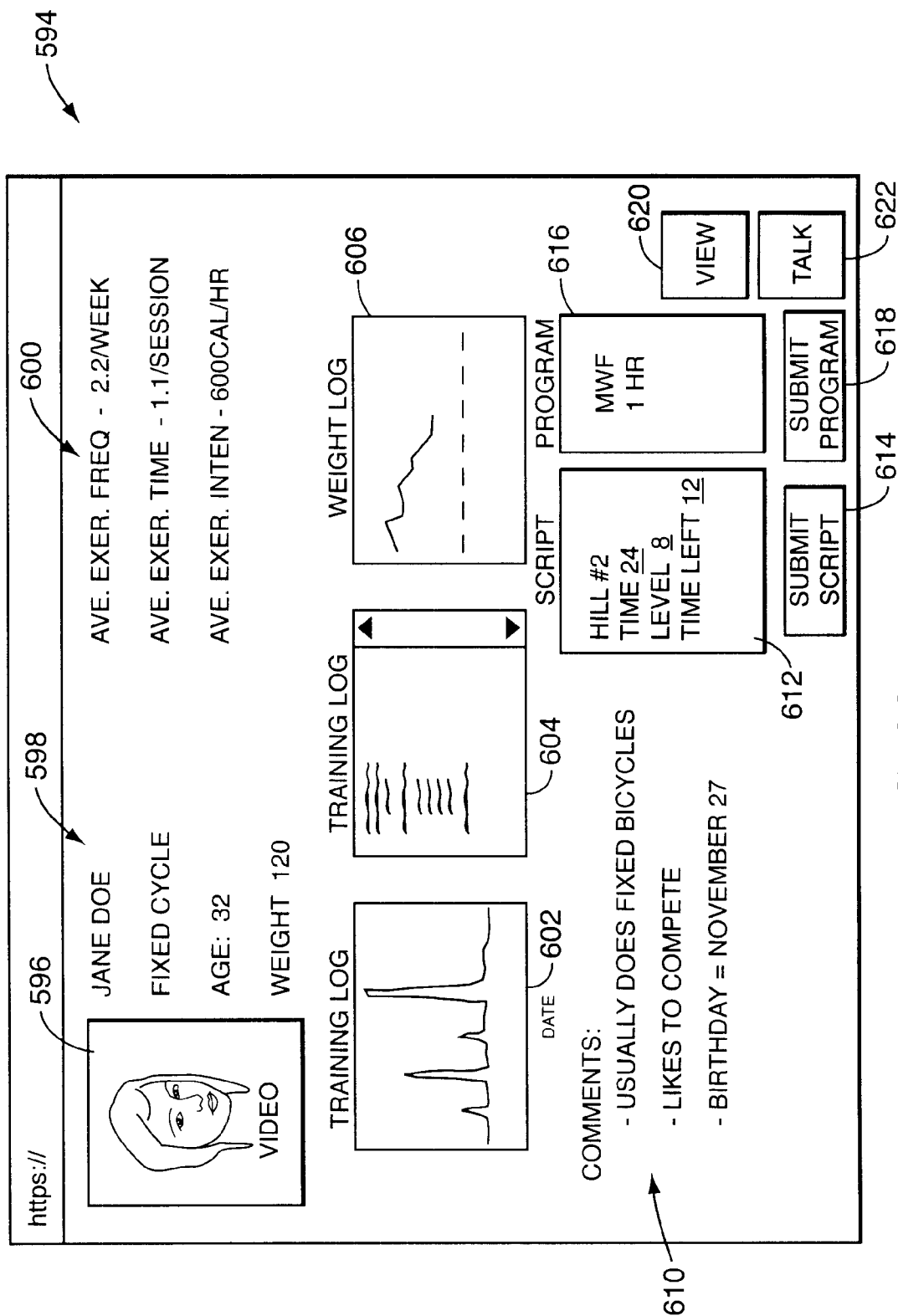


FIG. 33

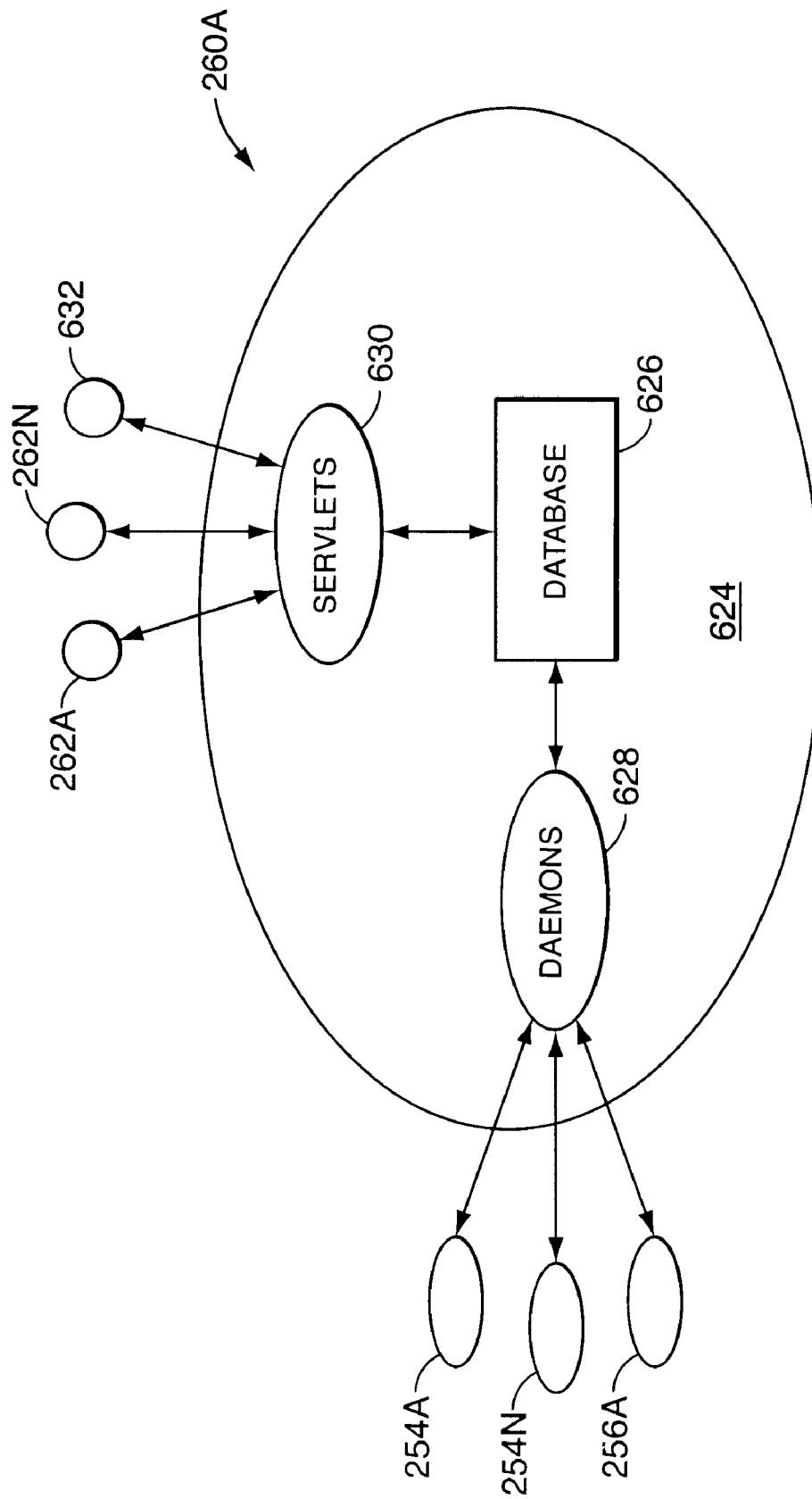


FIG. 34

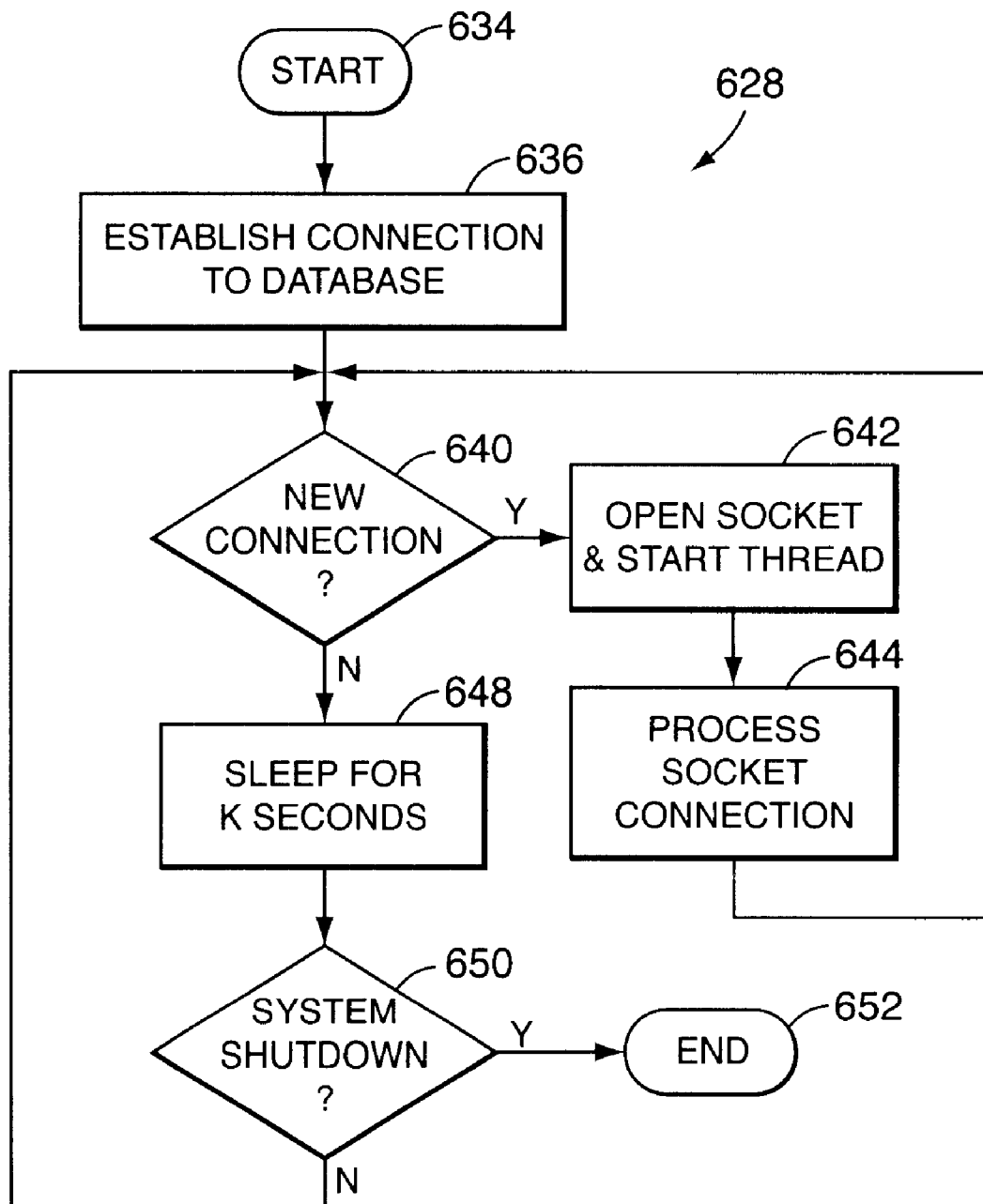


FIG. 35

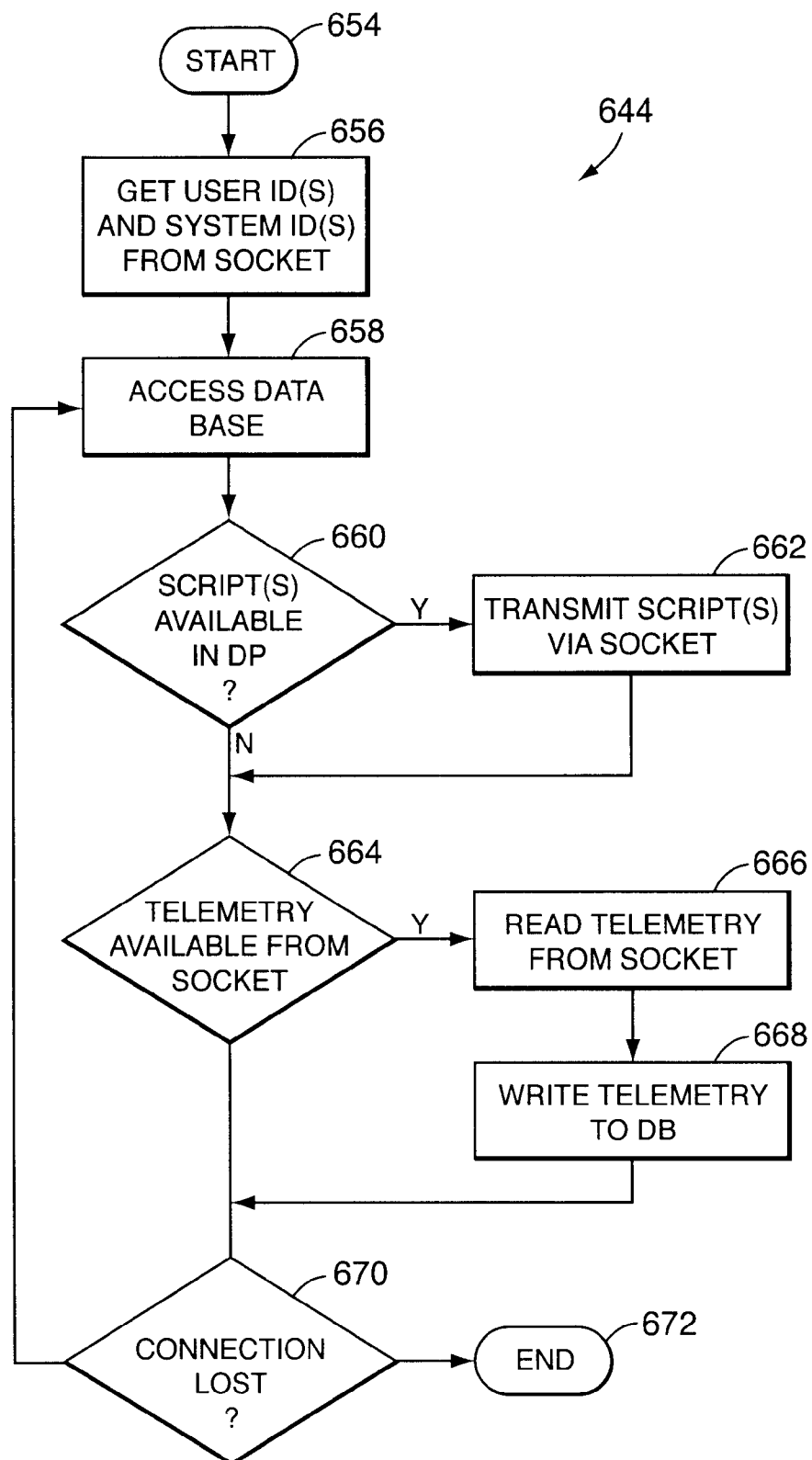


FIG. 36

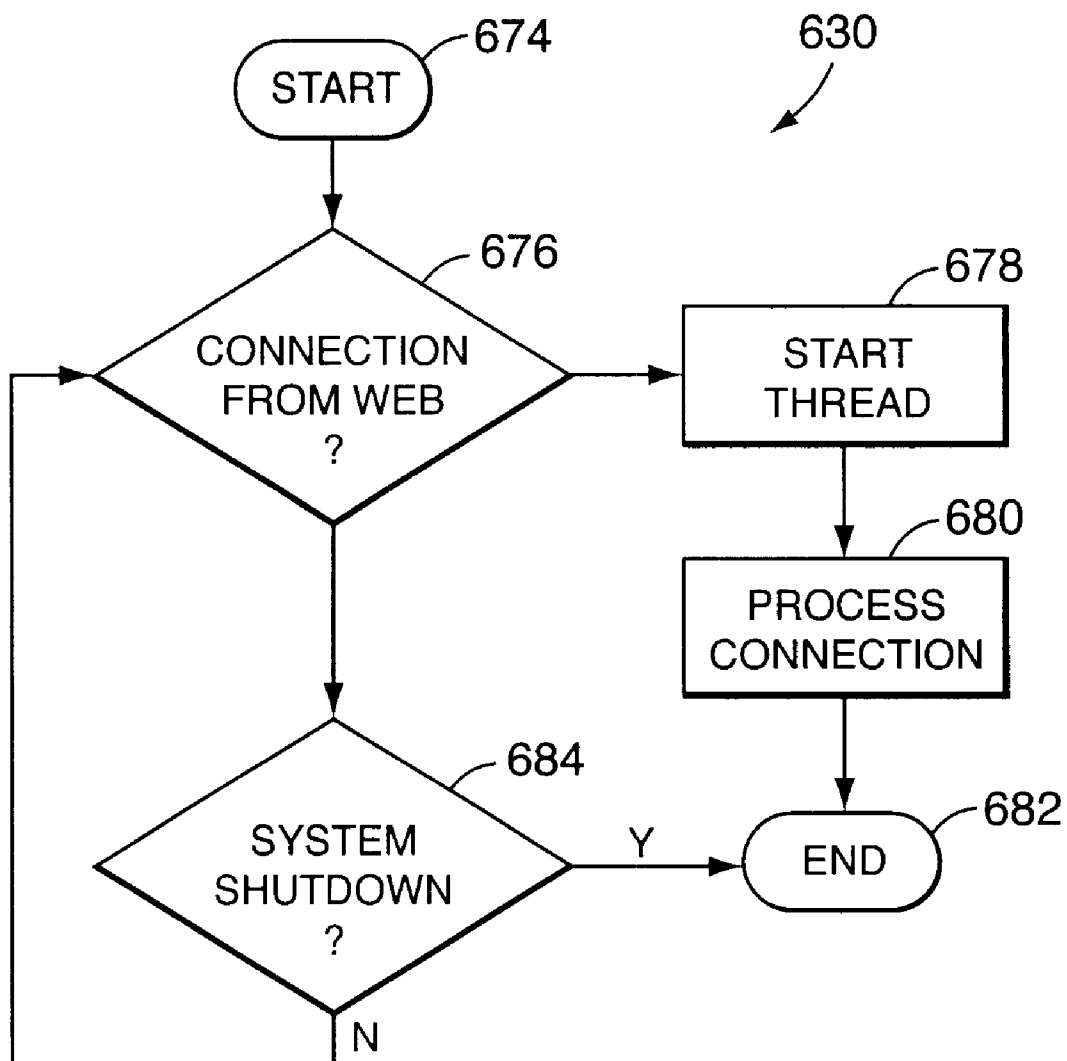


FIG. 37

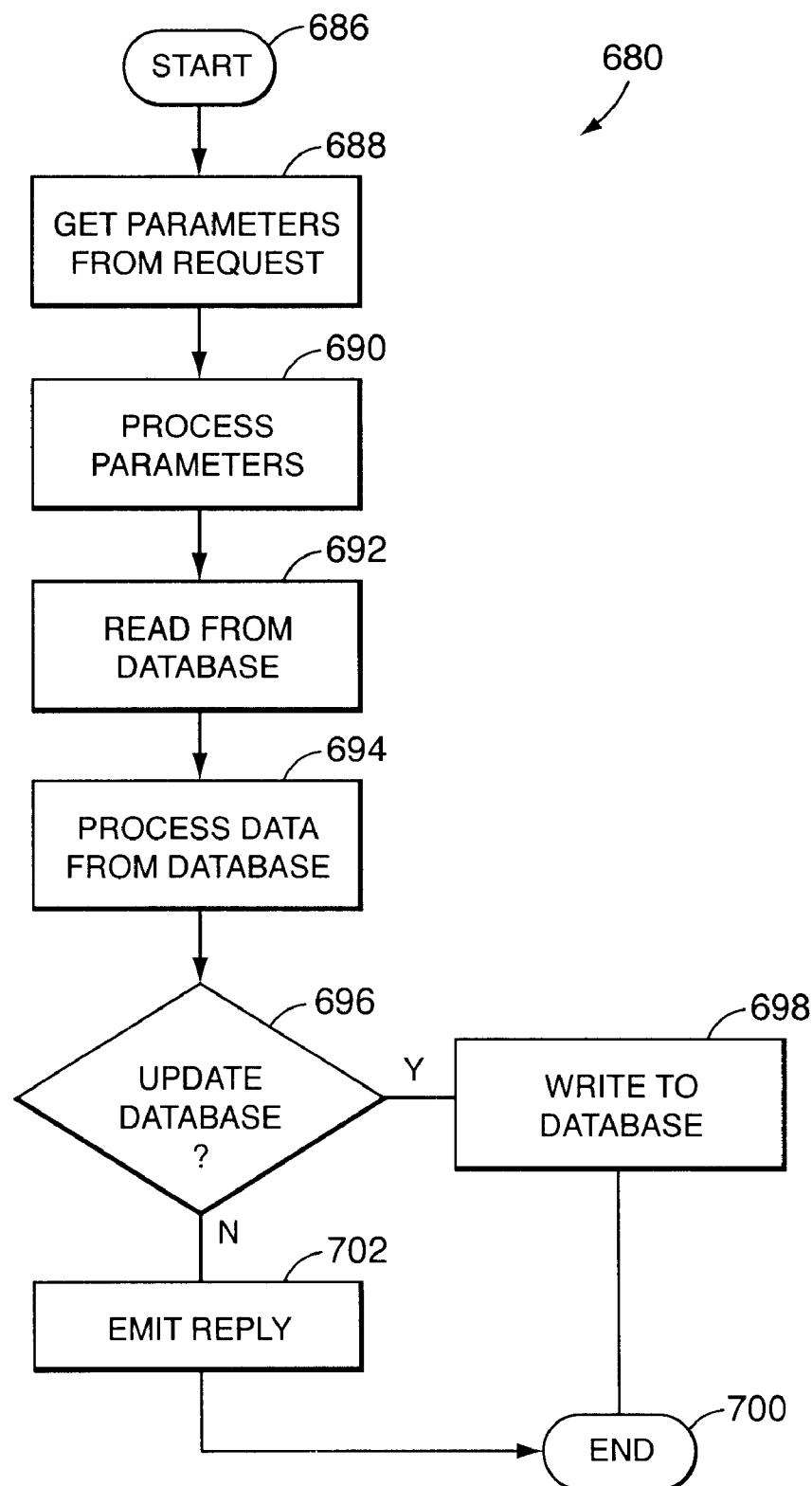


FIG. 38

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METHOD AND APPARATUS FOR REMOTE INTERACTIVE EXERCISE AND HEALTH EQUIPMENT

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to health and exercise equipment, and more particularly to computer networked systems including health or exercise equipment.

2. Description of the Related Art

Good health is a fundamental requirement for a happy and long life. A multi-billion dollar health and fitness industry has grown to help individuals meet this requirement. For example, there are a great many gymnasiums which provide facilities and equipment for aerobic and musculature development, and there are hundreds, if not thousands, of weight loss and diet centers and programs. The goals of these many programs typically include weight loss and/or maintenance, the improvement of aerobic fitness, improved circulation, increased strength, and body building or shaping.

There are several problems encountered with the use of gymnasiums, fitness centers, and diet centers. For one, they tend to be fairly expensive due to the need to maintain the facilities, pay rent and payroll, buy equipment, etc. In addition, these centers tend to be inconvenient in that they require a special trip to the center by individuals wishing to use their facilities. Both the price and the inconvenience tend to discourage use of these centers over time, allowing the individuals to lose incentive and drop out of their fitness or diet program.

A partial solution to this problem is home exercise and health equipment. Again, a large industry has arisen to provide exercise and health equipment for the home. This equipment tends to be more of the aerobic type, e.g. stationary bicycles, rowing machines, "step" machines, etc., although weight lifting apparatus, sometimes referred to as "resistance trainers," are also widely used in the home. These types of home exercise and health equipment increasingly use sophisticated electronics, such as microprocessors, to monitor the level of exercise and to provide exercise programs for the user.

Unfortunately, even well designed home exercise and health equipment often fall into disuse over time. This is because individuals, even in their own home, often lack the incentive to exercise when there are other, more enjoyable, activities available. Also, since there is typically not the camaraderie often found in a health club, diet center, etc., it is easier for users, as individuals, to discontinue their exercise or diet program.

Personal trainers have been used both at fitness clubs and in the home. Personal trainers are individuals who usually have a fitness training background and who typically provide personal training services to an individual customers. Personal trainers can be very effective in that they provide personal motivation and feedback to an individual in the exercise program, and thus often foster a more effective and longer-lasting exercise program. The downside of personal trainers is, particularly in the home setting, their relatively high cost. It is not unusual for a personal trainer to charge hundreds of dollars per month for their services. Therefore, while these personal trainers are very effective, they tend to be used by only a small percentage of the population.

It is also desirable to make exercise more of a group experience. It is well established that people are more likely

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to exercise in a group setting than they are on their own. With stationary exercise equipment this, in the past, could only be accomplished by physically locating the exercise apparatus near to each other, e.g. in a health club setting.

With mobile exercise equipment, the exercisers would have to group together, such as assembling a group for bicycle ride. In either case, the ability to share a group exercise experience required users to physically get together. Also, such group exercise experiences were typically limited to sametype exercise equipment. That is, bicycle riders rode with bicycle riders, swimmers swam with swimmers, etc.

Even the individual and group experiences within a gymnasium or health club can be somewhat lacking. The exercise equipment are typically stand-alone, without allowing for the gathering of exercise session parameters, interactivity, remote communications, etc. It would be desirable to have such experiences expanded with enhanced capabilities as well.

SUMMARY OF THE INVENTION

The present invention provides an exercise and health system which is convenient, affordable, and effective. The system includes computerized exercise and/or health equipment (the "local system") that can provide feedback and encouragement to the user, i.e. can serve as a "virtual personal trainer." These local systems often include a local server to service multiple exercise devices. In addition, the system includes a remote system communicating over a bi-directional data channel (preferably the Internet) with the exercise and health equipment. This remote system can include remote servers communicating with the local system, and remote work stations used by trainers and users to interact with the remote servers and local systems.

Since the exercise and health equipment can communicate with the user, it is possible for the health equipment to provide incentive and motivation to the user much in the same fashion as a human personal trainer. In addition, the health and exercise equipment can store data and other parameters concerning the exercise or other activities which can be used to monitor the progress and to vary the exercise program or script. In this way, the local system can serve as a "virtual personal trainer." The data and other parameters can also be stored in the local server and uploaded to the remote server. From there, the data and parameters can be processed and/or accessed from the workstations and the local systems.

The remote server is preferably associated with a number of local systems. The remote server can be considered to be the communication tool of a human personal trainer via a workstation, as opposed to the "virtual personal trainer" emulated by software in the local system. Further, the remote server can provide for competitions and group exercising between virtually any number of users in any number of locations. Some of the users may be in fixed locations (such as on a rowing machine or a stationary bicycle), while other users may be in mobile locations, such as bicyclists and joggers. With appropriate handicapping, a person on a stationary bicycle can race with a person on a road bicycle (or even join the Tour de France), or with a person on a rowing machine. Further, "virtual" competitions can be held wherein an exercise device represents, for example, a spaceship, such that the more energy expended by the user results in faster spaceship movement. Such "virtual" competitions may use standard sensor of the exercise equipment to "steer" the spaceships. For example, a person on a fixed rowing machine could steer by pulling harder on one oar

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than another, or “fire” a missile by pushing forward on both oars. However, it is anticipated that various “out of band” signals may also be used to create a virtual competition.

In a preferred embodiment of the present invention, a distributed wide area network (WAN) such as the Internet is used to couple local servers, remote servers, and workstations together. Users at local systems can interact visually and even in a tactile manner with other users over the Internet. For example, a first user at a first local station can take a “virtual ride” with another user at a second local station through the Internet connection. Likewise, a remote “personal trainer” can interact with a user at a local station via the Internet communication linkage.

The systems, methods, and apparatus of the present invention therefore can provide an effective exercise, dietary, and health program for a great number of individuals. The computerized health equipment provides incentive and encouragement to stay in the program, due to the “virtual personal trainer” of the local system, the human personal trainer of the remote system, and by the various services provided by the enterprise as a whole as supported by the server systems, peer systems, etc. For example, a variety of services of products can be offered to the users of the system to further their health and fitness goals. In addition, the camaraderie of exercising with other users can be provided.

The described invention therefore creates a “virtual gymnasium” anywhere and everywhere it is desired. For example, exercise equipment within a traditional gymnasium or health club can interact with exercise equipment that is out of doors or in a home environment. Furthermore, multiple exercise equipment can communicate with a local server (in, for example, a home, gymnasium, or health club setting) for the gathering of exercise session parameters, providing user feedback, generating reports, etc.

It will be appreciated that implementations of the present invention are ubiquitous, appliance-like, and scaleable. In particular, by providing an inexpensive base controller for minimal “in-band” communications, the controller can be provided on virtually every exercise apparatus at minimal cost, leading to the ubiquitous nature of the invention. By providing “plug-and-play” functionality, the system becomes appliance-like. In the wireless embodiments of the local system, a compatible exercise device needs only be brought into proximity with a local server to become a part of the system. Further, the local server has an extremely simple base interface: a reset switch. Of course, additional interfaces such as a touch-screen video display can add further functionality. Finally, the system is scalable because the same base architecture can be used to couple from one piece of exercise equipment to many pieces of exercise equipment to the local and/or remote servers of the system.

These and other advantages of the present invention will become apparent upon the rating of the following descriptions and the study of the figures of the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a health and fitness system in accordance with the present invention;

FIG. 2 is a block diagram of the local, remote, and server system computers of the present invention;

FIG. 3 is a flow diagram of a process running on a local system computer of the present invention;

FIG. 4 is a flow diagram of the “Process Exercise Activity” operation of FIG. 3;

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FIG. 5 is a flow diagram of the “Detect And Record User Activity, Provide Feedback” operation of FIG. 4;

FIG. 6 is a flow diagram of a “Process Local System Activity” operation of FIG. 3;

FIG. 7 is a flow diagram of the “Process Remote Activity” operation of FIG. 3;

FIG. 8 is a flow diagram of a process running on a remote system computer of the present invention;

FIGS. 8a, 8b, and 8c are three examples of data analysis performed in the “Process Data” operation 176 of FIG. 8;

FIG. 9 is a flow diagram of a process running on a server system computer of the present invention;

FIG. 10 is an illustration of a local system connected to other local systems, remote systems, and server systems via the Internet;

FIG. 11 is a block diagram of the local computer of the local system of FIG. 10;

FIG. 12 is an illustration of a “virtual ride” taking place over the Internet with users using two separate local systems;

FIG. 13 is an illustration of a remote interactive exercise and health system in accordance with the present invention;

FIG. 14 is a block diagram of a preferred control circuitry for an exercise device of the system illustrated in FIG. 13;

FIG. 15 is a block diagram of a preferred architecture for an interface of FIG. 14;

FIG. 16 is a flow diagram of a process executed by the microprocessor of FIG. 15;

FIG. 17 is a flow diagram illustrating the “Connect with Server?” process of FIG. 16 in greater detail;

FIG. 18 is a flow diagram illustrating the “Run Exercise Session” process of FIG. 16 in greater detail;

FIG. 19 is a flow diagram illustrating the “Execute Script” process of FIG. 18 in greater detail;

FIG. 20 is an illustration of a fixed local server of FIG. 13;

FIG. 21 is a block diagram of the server illustrated in FIG. 20;

FIG. 22 is a flow diagram of a process implemented by the microprocessor illustrated in FIG. 21;

FIG. 23 is a flow diagram of the “Run Cybergym Daemon A” of FIG. 22;

FIG. 24 illustrates the process “Run Cybergym Sessions” of FIG. 23 in greater detail;

FIG. 25 is a flow diagram illustrating the “Process Response” operation of FIG. 24 in greater detail;

FIG. 25A is an illustration of a transmitted data packet in accordance with the present invention;

FIG. 26 is a flow diagram of the “Run Cybergym Daemon B” of FIG. 22;

FIG. 27 is a flow diagram illustrating the “Run Online Mode” process of FIG. 26 in greater detail;

FIG. 28 is a flow diagram illustrating the “Run Offline Mode” process of FIG. 26 in greater detail;

FIG. 29 illustrates a first implementation of a mobile local server;

FIG. 30 is an illustration of a second local server of FIG. 13;

FIG. 31 illustrates a web page that may be displayed on a trainer machine of FIG. 13;

FIG. 32 illustrates another web page which may be displayed on the trainer machine for coaching online clients;

FIG. 33 is a web page that can be viewed on a trainer machine for coaching an individual client;

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FIG. 34 is an illustration of a Cybergym™ server of the present invention;

FIG. 35 is a flow diagram illustrating the operation of the daemon of FIG. 34 in greater detail;

FIG. 36 is a flow diagram illustrating the “Process Socket Connection” operation of FIG. 34 in greater detail;

FIG. 37 is a flow diagram illustrating the servlet process of FIG. 34 in greater detail; and

FIG. 38 is a flow diagram illustrating the “Process Connection” operation of FIG. 37 in greater detail.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIG. 1, a health and fitness system 10 in accordance with the present invention includes one or more local systems 12, one or more remote systems 14, and one or more server systems 16. The local systems 12 are typically home-based systems designed for the promotion of the health and fitness of individual users within a family. The remote systems 14 may be home or business based, and are used as data gathering and storage stations, as well as communication stations, between a human personal trainer and users of local systems 12. As will be discussed in greater detail subsequently, the remote system 14 is associated with a relatively large number of local systems 12, e.g. a personal trainer with a remote system might be in communication with 100 or more individual users of local systems 12. This is made possible, in part, by providing a “virtual personal trainer” at each of the local stations 12 to partially or fully replace the need for a human personal trainer at the local station. The server systems 16 can communicate with the remote systems 14 to provide server and control functions across the entire enterprise, i.e. over the entire system 10. As also will be discussed in greater detail subsequently, the server system 16 is associated with a number of remote systems 14.

The local system 12 includes one or more health or fitness devices such as a stationary bicycle 18, a weight or “resistance trainer” 20, a scale 22, etc. Associated with a local system 12 is a computer 24 which, in this preferred embodiment, is integrated into the stationary bicycle 18. A stationary bicycle as a “base unit” is given merely by way of example, as any piece of equipment (a rowing machine, a step machine, etc.) could house the computer 24, or the computer 24 could be housed separately. The computer 24 can serve as a “local server” for other health and fitness devices at local system 12, such as the weight trainer 20 and the scale 22. Alternatively, a separate local server 26 can be used to control and/or support various devices in local system 12 via data and control lines 28, and communicate with the remote system 14 via a telephone line 30 and a modem 32. However, in the present preferred embodiment, the assumption is that the local server 26 and modem 32 are not required and that the computer 24 will serve not only to control the operation and data gathering function of the stationary bicycle 18, but will also provide these functions for the weight trainer 20 and the scale 22. Of course, the weight trainer 20 and the scale 22 may include their own computer systems for local control purposes.

The stationary bicycle 18 includes a housing 34 which, as stated previously, preferably houses the computer 24, a crank 36 provided with a pair of pedals 38, a seat 40 supported by a seat stem 42, handle bar 44 supported by handle bar stem 46, legs 48, and feet 50. The various components of the stationary bicycle 18 are typically attached to a rigid frame that is internally connected to the housing 34.

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The weight trainer 20 is preferably a resistance-type weight trainer, such as a bench press machine, a biceps curl machine, a squat machine, etc. Typically the user grasps a bar connected to a cable that is attached to a resistance device. This resistance device can be weights, or can be an active resistance device such as a motor, or a passive resistance device such as an electrically actuated brake. Active resistance devices are advantageous in that they can provide a force-feedback that can closely mimic real-world conditions, i.e. the actual forces that might be felt by a user when lifting real weights with a human “spotter” or trainer. In any event, the amount of resistance to movement of the bar (or other portions of a piece of exercise equipment) is preferably under the control of the computer 24 and the script that it is running. Particularly with active resistance devices, the control by the local computer is important. This is because a tight feed-back loop between sensors and actuators (such as motors, solenoids, etc.) is desirable to create realistic force feed-back. This would be difficult to accomplish in a realistic manner over a communication linkage, unless such a linkage were extremely fast. However, even in the case of an extremely fast communication linkage, the performance of a remote computer would likely diminish as it was attempting to control even one local system, let alone many local systems. The scale 22 preferably provides an electrical connection to the computer 24 through an I/O port to allow the computer 24 to monitor the weight of the person standing on the scale.

The computer 24 is coupled to a variety of input/output (I/O) devices including a brake 52, a sensor 54, a display 56, a heart rate monitor (HRM) 59, a loudspeaker 58, an interface 60, a modem 62, and a voice board 64. In this fashion, the computer 24 can control and monitor the various functions of the stationary bicycle 18.

More particularly, computer 24 can, under software and hardware control, control the electrically actuated brake 52 which is coupled to the crank 36 of the stationary bicycle. In this fashion, the pedaling force that must be exerted on pedals 38 to cause the crank 36 to rotate at a given speed can be varied under computer control. This electrically actuated brake can be electric/mechanical brake, electric/magnetic brake, etc. as it is well known to those skilled in the art. The brake 52 can be passive (i.e. one that creates a frictional, magnetic or other drag) or active (e.g. a motor/generator that resists the movement of the crank 36). The sensor 54 is typically used to determine the rotations-per-minute (RPM) of the crank 36. In this way, the computer 24 can receive information concerning the level of effort being exerted by a user of the stationary bicycle 18. Rotation sensors are well known to those skilled in the art. The sensor 54 can also measure other parameters such as the force (torque) being applied to pedal 38, again to provide information to the computer as to the level of effort being exerted by the user of the bicycle.

The computer can provide an output on a display 56 that can be viewed by an individual user sitting on seat 40. This display can be a simple light display, e.g. a series of light emitting diodes (LEDs) or it can be a full video display. A preferred embodiment of the present invention provides a full video display to provide instructions and encouragement to a user of the stationary bicycle. For example, an image of a “virtual personal trainer” can be provided on the video display 56. This image is preferably the image of the human personal trainer who is in charge of the remote system 14.

The loudspeaker 58 provides another important communication medium to the user of the stationary bicycle 18. For example, under computer 24 control, the user can be told

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with either a digitally synthesized or digitally recorded voice to pedal faster, pedal slower, that they are doing a good job, etc. Of course, analog recording techniques can be used as well, but are considered to be less flexible and desirable. Preferably, the voice being used is that of the personal trainer associated with the remote system 14 that oversees that local system 12. Both voice synthesis and digital voice recording on computer systems 24 are well known to those skilled in the art.

A local interface 60 can be used to couple the computer 24 to additional health and fitness devices. In this instance, the local interface 60 is coupled to the weight trainer 20 and to the scale 22. This additional health and fitness systems can either "dumb" systems with limited digital computation and storage capabilities, or they can include full fledged computer system such as the computer system 24. In the present embodiment, the weight trainer 20 and scale 22 include digital control circuitry (e.g. a microcontroller) which can communicate with the more powerful computer 24 of the stationary bicycle 18. The various I/O devices, such as the loudspeaker 58 can be used in conjunction with these other devices 20 and 22, e.g. the weight detected by the scale 22 can be announced on the loudspeaker 58 along with an indication that this is an increase or decrease in weight from the last session. Also, as mentioned previously, the weight trainer 20 can include the equivalent of the electrically controlled brake 52 which allows the resistance of the weight bar or handle to be varied to provide resistance ("weight") training. This control of the brake within the weight trainer 20 can be controlled by a "script" of the computer 24.

The computer 24 is also coupled to a modem 62 for communication over a telephone line 30. Alternatively, the computer 24 can be coupled to the remote computer 14 by other communication linkages, such as ISDN digital transmission line, via a local area network, or via a wide area network (WAN) such as the Internet. In other words, the telephone line 30 represents only one type of data communication channel between the local systems 12 and the remote system 14. The Internet, which has been growing rapidly in popularity, is a particularly good communication linkage due to its ubiquitousness, power, and flexibility. As will be appreciated by those skilled in the art, the Internet is one form of distributed packet network where data is broken into packets which can travel along a multitude of paths between source and destination. The Internet (and private networks known as Intranets) are packet networks operating on the well-known TCP/IP protocols.

The present embodiment also includes a voice board 64 which can bypass the modem such that the loudspeaker 58 can be driven directly to the telephone line 30 in an analog fashion. Combination modem/voice boards are commercially available for personal computer systems, and are well known to those skilled in the art.

The remote system 14 includes, for example, a remote system computer 66 which is coupled to the telephone line 30 by a modem 68. In addition, a telephone 70 can be coupled to the line 30 by a voice board 72. Alternatively, the telephone 70 can be coupled to a separate telephone line so that simultaneous telephone and data links can be made. Still further alternatively, it is known to those skilled in the art that a single telephone line can be made to support both voice and data transmission. In any event, the telephone 70 can communicate directly with the loudspeaker 58 of the stationary bicycle 18 over the standard analog telephone line 30. Alternatively, the telephone 70 can communicate with the computer 66 as indicated by the broken line 74 and the

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computer 66 can communicate digital voice data via modem 68, telephone line 30 and modem 62, to the computer 24. The computer 24 can then store or pass through the digital voice data and play the voice input to the user of local station 12 via speaker 58.

As noted above, the computer 66 is used to communicate with the local system 12 via computer communication link or "transmission medium" such as the telephone line 30 or an equivalent. This communication can include the downloading of data and instructions to the computer 24, and can include the uploading of information from the computer 24 to the computer 66. This allows for interactive communication between the remote system 14 and the local systems 12.

The server stations 16 are used to further consolidate information from multiple remote system 14 and to provide a variety of services to the remote systems 14. While the remote system 14 may be housed in human personal trainer homes or work sites, the server system(s) 16 are preferably more regional or national in origin. In this way, the main office of the enterprise can access each of the server systems 16 to provide upgrades for software, exercise programs, exercise equipment scripts, etc., as well as receiving information from the remote computers 66 that can be used for further analysis and for providing further services. Part of this analysis can be on the general and specific level of fitness of various individual users of the local system 12, as well as marketing information that can be used to offer product and services particularly tailored for the various users of the local system 12. The performance of the human personal trainers at remote stations 14 can also be monitored. It should be noted that the server 16 can include direct connect server 76 and peer server 78 that can either be direct server itself (like server 76) to a number of remote stations 14, or which can be a specialized server (such as a dietary analysis server) coupled to one or more direct connect servers 76. In addition, higher-level servers can be used to further consolidate data from the direct connect servers 76 and/or the peer servers 78. For example, the direct connect servers 76 can be regional in scope, while higher level servers can be national or international in scope.

In FIG. 2, a computer 80 is shown in a block diagram form. This basic computer architecture can be used for the local system computer 24, the remote system computer 66, and the server system computer 76. Of course other and equivalent architectures (in the computational sense), such as parallel processing computers can be used in the present invention as well. In the disclosed embodiment, the computer 80 includes a microprocessor 82, random access memory (RAM) 84, read only memory (ROM) 86, real time clock (RTC) 87, digital mass storage 88, CD-ROM drive 89, and a number of input/output (I/O) ports 90. Preferably, the digital mass storage 88 is read/write memory such as a hard disk with adequate storage capacity (e.g. 40 megabytes to 2 gigabytes or more). In addition, CD-ROM drive 89 can be coupled to the bus to provide, in particular, images to be displayed on a display 56 of the local system 12. The various components 82-90 address, pass data, and pass control signals through a bus 92 which typically includes data (D), address (A), and control (C) lines, as it is well known to those skilled in the art. In addition, there are control and "glue" chips typically provided in the form of a "chipset" which are used to couple the various components of the system together. The design and manufacture of computer systems such as computer system 80 is well known to those skilled in the art, and such computer systems are commercially available, both as complete systems and as subsystems (e.g. motherboards) from a variety of commercial sources.

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In FIG. 3, a process 94 implemented on a local system computer 24 is illustrated in a flow diagram. The process begins at 96 and, in a decision operation 98, it is determined whether there is any activity which requires the attention local system computer. If not, the computer system 24 is in a “standby” mode and process control is returned to operation 98 in a recurring manner. If operation 98 does determine that there is some activity, one or more of multiple branches are made to process the activity. If the activity is “Exercise”, e.g. the stationary bicycle 18, the weight trainer 20, or the scale 22 is to be used, an operation 100 processes the exercise activity. If it is a “Local System” activity such as routine housekeeping, the local system activity is processed in an operation 102. If it is a “Remote System” activity, the remote system activity is processed in an operation 104. After the completion of any one of steps 100, 102, and 104, process control is returned to operation 98. Of course, other types of activities can be initiated by operation 98 such as, for example, a shut down activity which would cause a power-down of system, as will be appreciated by those skilled in the art.

In FIG. 4, operation 100 of FIG. 3 is illustrated in greater detail. The process 100 begins at operation 106 and, in an operation 108, a “welcome greeting” is created. This welcome greeting can be displayed on the screen 56 and/or can be heard from the speaker 58, and can be personalized to both the individual user of the local system 12 and the human personal trainer of remote station 14. For example, the image of the personal trainer can show up on the screen 56 with his voice saying “Good morning, Fred! I haven’t seen you since last Wednesday. Let’s try to get in a good work-out today!” This greeting forms a part of a “virtual personal trainer” at local system 12 which replaces some or all of the need for a human personal trainer to be present at the exercise session at the local system 12. The “virtual personal trainer” is, therefore, a computerized process which emulates part or all of the functions traditionally performed by a human personal trainer.

Next, in a selection operation 110, the user decides whether he wants to select his own training program for that session or if he would like the system 12 to select the program. If the user selects the program, he creates a user “script” of what kind of exercise program he would like to perform that day. For example, if the user wishes to simply bicycle at a fixed resistance for thirty minutes, that can be entered in operation 112. Alternatively, more complex “scripts” can indicate that he would like to bicycle with interval training for thirty minutes, and then do five repetitions on the weight trainer 20.

If, however, the user allows the system 12 to select the section type, operation 114 controls the script selection. This is the preferred mode for using the local station 12 in that the script can be influenced not only by the local station 12, but also by the human personal trainer at the remote system computer 66. For example, data concerning the user’s previous performances and the personal trainer’s guidance can be stored in mass storage 88 (e.g. on a hard disk) so that a custom-tailored, interactive exercise program can be provided.

As noted above, the exercise program preferably proceeds according to “scripts.” A script is simply a sequence of exercise or other health-related events that are performed in fixed or variable sequences. The order and structuring of the script can be modified based upon monitoring the user’s performance or by other user feedback. For example, if it is detected that the user is getting tired due to a slowing of the exercise repetition rate, the operations or parameters of the

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exercise script can be modified accordingly. In other words, certain script steps can be skipped or the parameters concerning the steps can be modified. For example, if a user is determined to be tiring by the local system 12, and if the script says the next exercise event is to be ten repetitions on the weight trainer 20, that operation could be skipped. Alternatively, the weight training operation could still be done, but the resistance parameters could be modified. For example, instead of doing ten repetitions at a hundred pounds resistance on the weight trainer 20, eight repetitions at eighty pounds of resistance might be called for. The script therefore provides a general framework of a desired exercise session which can be varied based upon human personal trainer input from remote system 14, user input at local station 12, and detected user performance at local station 12.

Once the script has been initiated in either operations 112 or 114, an operation 116 detects and records user activity and provides feedback to the user. This operation will be discussed in greater detail subsequently. Such parameters as the rotations per minute (RPM) of the crank 36, the timing and speed of the resistance weight repetitions of weight trainer 20, the detected weight on the scale 22, etc. can all be recorded in the mass storage 88 of the local system computer 24. In addition, user feedback is provided. For example, if the person is cycling too slow on the stationary bicycle 18, the computer 24 can generate an encouragement on speaker 58 that the person should pedal faster. Alternatively, if it is determined that the user is over-exerting, such as pedaling too fast, a cautionary warning can be issued on speaker 58 to slow down. Another important input is the heart rate monitor (HRM) 59 which detects if the heart (pulse) rate is rising too high.

Next, in an operation 118, it is determined whether the session is a modifiable session. Most sessions are preferably be modifiable, unless the user selects, in an operation 112, a non-modifiable session. If the session is modifiable, the session is modified in an operation 120 based upon the selected script and upon user activity or other input. For example, if the heart rate monitor 59 detects that the pulse rate is too high, the resistance on the crank 36 can be reduced via a signal to the brake 52. Next, in an operation 122, it is determined whether the session is completed. This is usually based on the script, although the user can always terminate a session. If the session is not completed, process control is returned to operation 116 to repeat the loop. If the session is completed, the session records are updated in the mass storage 88, as are the scripts, as indicated in operation 124. The process 100 is then completed at operation 126.

In FIG. 5, the operation 116 of FIG. 4 is explained in greater detail. Process 116 begins at 128 and, in an operation 130, exercise parameters relative to the script are stored, preferably in mass storage 88. These parameters depend on the type of exercise being done, and the type of sensory input available to the system 12, but typically includes such things as time, RPM, resistance, machine state, etc. These exercise parameters are used to control the implementation of the exercise script, and are stored for later analysis.

Next, in an operation 132, it is determined whether encouragement is needed. An example of encouragement being needed is when the person is slowing down below the suggested repetition rate or speed in the script or, for example, has stopped exercising entirely. In such circumstances, encouragement is given in an operation 134. Again, this encouragement can be auditory via speaker 58, or visual via display 56, a combination of the two, or in any other suitable fashion. Next, in an operation 136, it is determined whether a caution is needed. If so, the caution is

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given in an operation 138 either through auditory, visual, or other ways. Caution might be needed if the user is exercising faster than that suggested by the script or if a dangerous physical condition is detected, such as by the HRM 59. Next, in an operation 140, it is determined if a script preview should be provided. If yes, an operation 142 provides an auditory, visual or other type of preview of upcoming script events. For example, the system 12 could be taking a user on a imaginary bicycle ride through the country. The script preview would then, in an operation 142, indicate something like "We are now approaching a hill. You will note an increased resistance to pedaling in a few seconds which will steadily increase until we reach the crest of the hill in about one and a half minutes." These operations 134, 138, and 142 are further examples of the local system 12 serving as a "virtual personal trainer." The process 116 is completed at operation 144.

In FIG. 6, operation 102 of FIG. 3 is illustrated in greater detail. Process 102 begins at operation 146 and, in an operation 148, it is determined what type of local system activity is to be performed. Three different local system activities will be discussed herein by way of example. As a first example, the local system activity can be to alert the user as indicated in an operation 150. For example, the local computer 24 can detect that it is time for a scheduled exercise session. The computer 24 can then communicate with the user via speaker 58 that it is time for a scheduled exercise. In this instance, the computer 24 would use a real time clock (RTC) 87 to know that it was time to initiate the exercise session. After completion of operation 150, process control is returned to operation 148.

A second type of local system activity would be house-keeping. For example, in an operation 152, diagnostics can be run to check the operability and calibration of the various components of local system 12. Also, in an operation 154, data compression, hard disk compaction, and data preparation can be accomplished.

A third example of local system activity detected by operation 148 is a local communication within the local system 12. For example, the weight trainer 20 or the scale unit 22 might be communicating to the computer 24 via the interface 60 or vice-versa. An operation 146 processes the data from the local unit accordingly and can provide commands to the local unit for the exercise or health session. Process control is then returned to operation 148 after the completion of operations 150, 154, and 156.

In FIG. 7, operation 104 of FIG. 3 is illustrated in greater detail. The process 104 begins at 158 and, in an operation 160, the connection is established with the remote system. Next, in an operation 162, information is uploaded or downloaded, the process is completed at 164. It should be noted that the connection of operation 160 can be either an incoming connection or an outgoing connection. If there is an outgoing connection to a remote system computer 66 the modem 62 makes connection with the telephone line 30 and dials the telephone number of the remote system computer 66. For an incoming connection, the modem 62 detects an incoming call on telephone line 30, picks up the line, and connects to the local system computer 24.

Since the systems 12 are typically home based, the user may wish to use a single telephone line for both normal telephone needs and for use by the system 12 for operation 160. It would, of course, be simpler to have an additional telephone line installed simply for the system 12, but this may be impractical from a cost point of view. If the system 12 is sharing the telephone line with the other telephones and

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devices in the household, mechanisms and/or processes are preferably provided to prevent interference with normal telephone usage. If the local system 12 initiates the call to the server 66, it would simply need to detect whether the telephone line was available so as not to interfere with other use of the telephone line. It can help ensure this availability by calling at unusual times, such as the middle of the night or when it is known that the user is away from the home, e.g. at work.

However, with incoming calls from a computer 66 to the computer 24 on a single home line, some way of distinguishing between calls for the local system 12 and other kinds of telephone calls should be preferably provided. Again, this could be time-based such that it is implied that a telephone call in the middle of the night is for the local system 12. The RTC 87 could be used for timing purposes in this situation, or the computer could simply start a counter. In this instance, the modem 62 would pick up the telephone quickly before other devices, such as an answering machine for a facsimile machine, would have a chance to pick it up. Alternatively, the local system 12 could allow a number of "rings" before picking up the line. For example, the local system 12 could allow the telephone line 30 to ring six times before modem 62 picks up the line. In a still further instance, the computer 66 might be calling a local computer 24 and have the phone line picked up by the user or by another device (like a telephone answering machine) coupled to the telephone line 30. In this instance, the computer 66 could hang up the line and call back a second time. Since the computer 24 can monitor the line via modem 62, it could know that a call back within, for example, thirty seconds of a hang up is for the computer 24. Alternatively, it could listen to the line on the first call to determine if it was computer 66 calling, and then pick it up the line 62 immediately on any call back, or call back the remote system computer 66 itself when the telephone line was free. Again, RTC 87 can be used for timing purposes, or counters can be used, as is well known to those skilled in the art.

Information being uploaded can include parameters and data stored in the mass storage 88 concerning the exercise sessions by the user(s) of the local system 12. It can also include other system information used for diagnosing or improving the operation of the local system 12. In addition, information can be downloaded to the local system 12 from the remote system computer 66 to, for example, change exercise scripts for a user, provide upgrades for the software running on the local system computer 24, etc.

In FIG. 8, a process 166 running on a remote system computer 66 is illustrated. The process 166 begins at 168 and, in an operation 170, an activity type is determined. A first type of activity is a batch system connection whereby the remote system computer 66 sequentially connects with a series of local systems for the uploading or downloading of information. This process is accomplished in operation 172. A batch system connection can be used to update the software on a number of computers 24 of local system 12, or to upload exercise session data from a number of local systems 12 on a regular basis, e.g. daily, weekly, monthly, etc.

If operation 170 detects a single system activity type, an operation 174 connects the remote system computer 66 to a single local system 12 for uploading and/or downloading as described previously. If an activity type "Process Data" is detected by operation 170, an operation 176 prepares data on the computer 66 for storage, processing, communication, and/or analysis. Examples of some types of analysis of the data will be discussed subsequently with referenced to

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FIGS. 8a–8c. Finally, if an activity type “Server Connection” is detected, a connection is made with the server 76 to upload or download information. The server connection can be initiated by the computer 66, or it can be initiated by the server system computer 76 depending on the circumstances. Upon the completion of any of the operations 172, 174, 176, and 178, process control is returned to operation 170.

In FIGS. 8a–8c, several examples of types of data analysis that can be performed on the remote system computer 66 in operation 176 of process 166 are illustrated. Of course, this analysis can be accomplished at any of the computers on the system 10 including the remote system computer 66, server system computer 76, peer system computer 78, or even on the local system computer 24. In FIG. 8a, a display of exercise activity is shown. This display can be on the display on a video display, such as a display 56, or it can be printed to make a permanent record. Along the y axis are the number of minutes of exercise, and along the x axis are the days of the week. As seen in the illustration of FIG. 8a, on Monday the user had twenty minutes of exercise, on Tuesday the user had sixty minutes of exercise, and on Thursday the user again had twenty minutes of exercise.

In FIG. 8b, another display or print out of, preferably, the remote system computer 66 is a summary of daily exercise activity. As noted, the Monday twenty minute exercise session actually consisted of a ten minute cycling session and a ten minute weight session. Also included is a summary of the number of calories burned and other parameters associated with those activities.

In FIG. 8c, a plot of the user’s weight as taken from scale 22 is shown illustrating the day-by-day weights of the user during part of the month of January. In this way, users are provided with good feed-back concerning the progress he/she is making in reaching their ideal weight. This information can be used by the remote or server systems to modify the exercise scripts and/or provide dietary counseling or products to the individual users of local stations 12.

As noted, the analysis of the data is preferably accomplished at the site of the human personal trainer, i.e. the site of the remote system computer 66. However, this analysis can also be accomplished at upstream or downstream computers. As mentioned previously, the computer 24 of the local system 12 is perfectly capable of making these types of analysis and displaying the on the display 66. Also, a simple printer I/O port can be provided in the stationary bicycle 18 to allow a printout of the graphs and charts that were shown by way of example in FIGS. 8a, 8b, and 8c.

In FIG. 9, a process 180 running on server system computer 76 is illustrated. In many ways, the process 180 running on the server system computer 76 is very similar to the process 166 running on the remote system computer 66. The process 180 begins at 182 and, in an operation 184, an activity type is detected. One type of activity type is the batch connection where the server sequentially (e.g. serially and/or in parallel) connects to a series of remote system computers 66 for uploading and downloading information. This process is accomplished at operation 186. Another activity type detected by operation 184 is the single system connection accomplished in operation 188. In operation 188, the server connects to a single remote system for uploading or downloading. In the case of operation 186 where there is a batch connection, the server system computer 76 will almost always be the initiating computer for the connection. With the single system connection however, the initiation of the connection can come either from the server 76 or from the remote system computer 66.

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If operation 184 detects a “Process Data” activity type, the data for multiple remote system computers 66 (which includes data from multiple local system 12) is prepared for storage, processing, communication, and/or analysis in an operation 190. If an operation 184 determines that there is to be a peer-to-peer connection with a peer server 188, an operation 192 makes the connection with the peer server to pass data back and forth. Of course, there are other activity types that can be performed by the process on server system computer 76, these four being by way of example. After the completion of operations 186, 188, 190, or 192, process control is returned to operation 184 to detect another activity type.

In FIG. 10, an Internet linked version of the present invention is illustrated. Those portions of the system that are similar to those previously described use the same reference numbers. It should be understood that while this embodiment is described in terms of the Internet, is also applicable to other forms of networking. However, a data packet network such as the Internet, or an Intranet, operating on a TCP/IP protocol is preferred.

In FIG. 10, a local system 12a is provided with an Internet access apparatus 196, and an enlarged video display such as a television 198. The television 198 can be any standard television (currently typically an analog television) which can develop an image provided over a cable or wire 200 from the Internet access apparatus 196. Internet access apparatus such as apparatus 196 are available from variety of vendors at the present time, and are generally referred to as a “set-top Internet boxes.” Set-top Internet box 196 typically communicates with a user via Infrared (I/R) data linkages, such as I/R linkages 202 and 204. In the present invention, these linkages are used to communicate with the local system 12a, as will be appreciated by those skilled in the art. Some optimization of the software in the apparatus 196 may be preferable to communicate with the local system 12a, although standard apparatus 196 can also be used by having the local system 12a emulate a remote I/R unit or remote I/R keyboard.

Local system 12a includes an I/R transmitter 206 which produces an I/R beam 202 that can be detected by an I/R detector 208 of the Internet access apparatus 196. The local system 12a also includes an I/R receiver 210 which receives an I/R beam 204 generated by an I/R transmitter 212 of the Internet access apparatus 196. Techniques for communicating between electronic devices with I/R beams are well-known to those skilled in the art.

If a higher-bandwidth linkage or “link” is preferred between the local system 12a and the Internet access apparatus 196, a cable or the like can be provided to connect the two. Also, it will be appreciated by those skilled in the art that the Internet apparatus 196 is only one method for accessing the Internet, other methods including the use of personal computers, etc. Higher-bandwidth is likely to be desired if a video camera 214 is used to transmit video over the Internet.

The Internet access apparatus can be coupled to the Internet 216 by a number of communication linkages or “transmission media.” For example, if the Internet access apparatus 196 includes a cable modem, a cable 217 can be coupled to an Internet server at a cable provider 218 to couple to the Internet 216. Alternatively, if the Internet access apparatus is provided with a standard modem, a telephone line 220 can be coupled to a Internet server at a telephone provider 222 to couple to the Internet 216. Finally, if a wireless modem is provided by Internet access apparatus

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196 with an antenna 224, an Internet server at a wireless provider 226 with an antenna 228 can be used to couple to the Internet 216.

Also coupled to the Internet 216 are one or more local systems, such as local systems 12b and 12c, one or more remote systems 66', and/or one or more server systems 76'. Since the local, remote, and server systems are all coupled to the Internet 216, their hierarchy is more a logical hierarchy rather than a physical or wired hierarchy. In other words, the local systems can talk with each other and with the remote system 66, and the remote systems can talk with each other and with the server system 76 in a "logical hierarchy."

In FIG. 11, a computer system 24 ("local computer") of local system 12a is illustrated in greater detail. As previously described, the local computer 24 can comprise the motherboard of a standard personal computer that has been programmed to perform the process of the present invention. Most of these processes have already been described, and will not be repeated here. The computer 24 is operative to control the I/R transmitter 206 and the I/R detector or receiver 210 to implement communication with the Internet access apparatus 196. As mentioned previously, these communication linkages can be augmented or substituted by other types of communication linkages, such as a higher-bandwidth cable or twisted pair linkage to the Internet access apparatus 196. In addition, the computer 24 can receive video data from a video camera 214 of the user. This video data can either be real time data, or a series of video "snapshots," e.g. a "frame" a video sent every few seconds. Preferably, if this video data is to be sent over the Internet, it is compressed by some form of standard compression algorithm, such as MPEG.

Also shown in FIG. 11 are a number of "active" actuators 220, 222, 224, and 226. These actuators are controlled by computer 24. Actuator 230 is coupled to the crank 36 of the pedal 38 to provide a tactile, haptic, or "force" feedback on the pedal 38. Likewise, actuators 232, 234, and 236 are provided to provide a tactile, haptic or "force" feedback on the stem 42 of seat 40, on the stem 46 of handlebar 44, and on the frame or enclosure 34 itself. Therefore, "real-world" forces such as hitting a rock, wind forces (which tend to exert the force on the handlebar 44) and others can be imparted on the user of the local system 12a.

The actuators 230-236 can be motors, solenoids, and other forms of forceproducing mechanisms. They can be electrically, hydraulically, or pneumatically controlled, although electrically controlled actuators are preferred. It should also be noted that the actuators can also serve as sensors that can be "read" by the computer 24. Also, the actuators can be used to provide mechanical resistance. For example, the actuator 230 can eliminate the need for a friction-type brake 52. Also, the actuator 234, if of a suitable type, can be used to both sense the position of the handlebar 44 and to provide a force feedback on those handlebars.

In FIG. 12, a "virtual exercise session" in a "virtual world" is illustrated. More particularly, an image I is developed on the screen 238 of the television 198 which simulates both the user 240 and one or more individuals 242. These one or more other individuals can be users at other local machines, or can be the "personal trainer" at another local system or at a remote system. In this instance, the user is riding a bicycle along a road 244 and is trailing behind the other user 242 also riding a bicycle. Through the use of the actuators, the user 240 can feel the surface of the road, can get a "boost" when going downhill and feel a "drag" as he goes uphill, can feel the affects of a wind 246, can feel the

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lessening of resistance to pedaling when "drafting," i.e. riding closely behind, the other user 242, etc. With the use of the video camera 214, an image of the other user 242 can be provided on the screen 238, e.g. pasted onto the cycling figure's body 242, as can be the image of the user 240 on the screen of the local system of user 242.

Of course, there are many "virtual worlds" that one or more users of the exercise apparatus can inhabit. For example, the user can be a standard gymnasium or health club, and wander from exercise equipment to exercise equipment while interacting with other user/exercisers and personal trainers in this virtual world. In consequence, the user 240 is motivated to exercise in much the same way as if he journeyed to a gymnasium or health club, without leaving the comfort and convenience of home.

FIG. 13 illustrates a remote interactive exercise and health system 250 in accordance with a preferred embodiment of the invention. This embodiment, as was the case with the previous embodiments, may be implemented over a wide area network (WAN) such as the Internet 252. The remote interactive exercise and health system 250 preferably includes a number of fixed local systems 254A-254N and one or more mobile local systems 256A-256N. The system 250 also preferably includes a remote server 258 which can include one or more physical or "virtual" servers 260A-260N. The system 250 also includes one or more trainer machines 262A-262N.

A fixed local system, such as fixed local system 254A, typically includes one or more health and/or exercise devices (often referred to herein as simply "exercise devices", "exercise apparatus", etc.) such as exercise devices 264A-264N. These one or more exercise devices 264A-264N are associated with a fixed local server 266. Of course, additional fixed local servers can be implemented as will be appreciated by those skilled in the art. The exercise devices 264A-264N can be of a variety of types such as stationary bicycles, weight lifting machines, operation machines, treadmills, scales, etc. As a minimum, the exercise devices 264A-264N should include at least one sensor which permits data to be processed and sent to the remote server system 258 via the Internet 252. The exercise devices can also include passive devices such as scales, heart rate monitors, etc., which typically have an output dependent upon one or more sensors. It is preferable, but not essential, that the exercise device 264A-264N includes some type of feedback or actuator which mechanically influence the exercise device to vary the resistance, provide tactile feedback, provide haptic feedback, etc., to a user.

Typically associated with an exercise device is a user such as user 266A-266N. The users 266A-266N interact with the system 250 at least through the exercise devices 264A and 264N. Such interaction will be referred to herein as "in-band" interaction. However, the users 266A-266N can also interact with system 250 through "out-of-band" interactions 268A-268B. As will be discussed in greater detail subsequently, these "out-of-band" interactions do not necessarily go through the Internet 252. For example, a user 266A may be interacting with the fixed local server 266A on a separate, high speed data connection to provide real time video information to the exercise device 264A. Alternatively, the out-of-band interaction 268A could be a cellular phone conversation with a personal trainer.

Of course, out-of-band interaction can also be performed in-band. In a preferred embodiment of the present invention, an inexpensive controller and interface providing low-data rate "in-band" transfers for an exercise device is seen to be

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preferable. Such a controller will add only minimally to the cost of the exercise device (which typically needs a controller anyway), permitting manufacturers to provide the “in-band” compatibility on virtually their entire product line. This “in-band” transfer is primarily a transfer of sensor data (from the exercise device) and scripts and other data to the exercise device. Other, high bandwidth transfers, such as streaming video and audio, etc., can be accomplished with an add-on “out of band” device. For example, a head mounted display and earphones can provide an out of band experience. Nonetheless, other embodiments of the present invention utilizes a single, high-speed channel, such as an 802.11 protocol channel, to couple the exercise device to the rest of the system. Of course, this would require a much more complex controller, approaching the complexity of a personal computer, to be provided for the exercise device. If a suitably powerful controller were provided in the exercise device, then all data transfers could be “in-band.”

Similarly, the mobile local systems **256A–256N** typically include mobile exercise devices **270A–270N** and mobile local servers **272A–272N**. In this instance, there is usually a one-to-one correspondence between a mobile exercise device **270A** and a mobile local server **272A**. However, in alternate embodiments of the present invention, two or more exercise device **270A** may be associated with a single mobile local server **272A** by, for example, wireless connection. Often, the mobile exercise devices **270A** include one or more sensors, such as an RPM sensor, a GPS sensor, an elevation sensor, an energy expended (wattage) sensor, a pulse rate sensor, an oxygen saturation sensor, etc. The mobile exercise devices **278A** are typically not provided with actuators, although it is possible to do so. For example, a mobile bicycle can be provided with an actuator which would shift gears on the bicycle. Nonetheless, other feedback can be provided to a user of mobile exercise equipment **270A** through the “in-band” and/or “out of band” connection, such as current location, advice from the trainer, etc., via, for example, a display on a bicycle computer. Again, associated with each of the mobile exercise devices **27A–27N** are one or more users **274A–274N**. These users can interact with the system **250** by the “in-band” experience and/or by an out-ofband experience **276A–276N**. Again, these out-of-band experiences can be high speed data connections to the local mobile computer or true out-of-band experiences such as a cellular telephone conversation with the trainer.

The remote server **258** is in an at least part time communication with the local systems **254A–254N** and mobile systems **256A–256N**. As will be appreciated by those skilled in the art, the remote server system **258** can include one or more physical and/or virtual servers **260A–260N**. This permits the easy scalability of the system **250** as more users and trainers use the system. Typically, the remote server system **258** is the intermediary for communication between local systems and trainer machines, but in alternate embodiments of the present invention, local servers may communicate directly with each other or through the Internet **252** or directly to a trainer machine through the Internet **252** or other transmission media, as will be appreciated by those skilled in the art.

The trainer machines **262A–262N** are typically associated with individual trainers **276A–276N**. The trainers may interact with the system **250** through in-band communication or may communicate with, for example, users **266A–266N** and **274A–274N** through out-of-band communication **278A–278N**. Such out-of-band communication can be, as explained previously, cellular or telephonic communication

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with one or more users. Alternatively, streaming video and/or audio, video files, audio files, graphics, etc. can be provided to the user and/or the trainer through an in-band or out of band communications link. The trainer machines **262A–262N** are preferably personal computer systems using the Microsoft Windows or Mackintosh operating systems, for example, and provided with a display screen, keyboard, and pointing device such as a mouse. Preferably, the interface between the trainers **276A–276N** is a World Wide Web (WWW) type interface. For example, a web browser such as Microsoft Explorer™ or Netscape Navigator™ can be used on the trainer machines **262A–262N** to access a secure website on the remote server system **258**, as will be explained in greater detail subsequently.

The present system is well suited for franchise and multi-level marketing systems. Trainers can buy a franchise, or operated as an independent contractor, and sell memberships to users. A user can then either buy or lease a local system, along with the service provided by the trainer. As trainers obtain too many clients for them to personally manage, they can create sub-franchiser or sub-contractor trainers for some of the clients. The top level trainers will not only obtain compensation for each of their direct clients, but they will also obtain a smaller share of the compensation for their indirect clients through the sub-franchiser or sub-contractors. Trainers can also be sponsored, e.g. by a company for its employees.

FIG. 14 is a block diagram of an exercise device circuit which can be associated with, for example, an exercise device **264A–264N** or **270A–270N**. More particularly, an exercise device controller **280** includes an interface controller **282**, a sensor **284**, and a transmitter **286**. By “transmitter” **286**, it is meant that the appropriate drivers are provided to create a signal **288** which can be transmitted to a local server via wired, optical, wireless, or other transmission media. The sensors **284** are preferably coupled to a resistance mechanism or actuator **290**. The interface controller preferably also includes a device ID **292**, a user ID **294**, switches and keyboard **296**, and a display **298**, such as a flat panel display. The controller **280** can also optionally include an actuator **300** and a receiver **302**. The receiver **302**, like the transmitter **286**, can receive a signal **304** via a variety of transmission media including wired, wireless, optical, fiber optic, etc.

A reason for “in-band” base functionality is to make the basic controller ubiquitous to exercise equipment. By making the base functionality whereby interaction with the sensors and actuators of the exercise equipment is supported, but not necessarily high-bandwidth interactions, the controller can be made very inexpensively and put into almost any exercise device with electronic circuitry. The more expensive circuitry for high-bandwidth interactions can be provided separately with the “out of band” capabilities of the present invention.

The interface controller **282** is preferably an integrated microcontroller having microprocessor, RAM, EPROM, and various interfaces. Alternatively, the interface controller can be implemented with discrete components. The purpose of the interface controller is twofold, namely to interact with the sensor and/or actuator of an exercise device and to provide communication interfaces to a user and to other portions of the remote interactive system **250**. It is desirable that the interface controller be relatively low cost so they can be added to each piece of manufactured exercise device such that the interface become ubiquitous.

In addition to communicating with sensor **284** and actuator **300**, the interface controller **282** can provide a display on

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display 298 to enhance the exercise session for the user. The display can provide internally developed parameters such as RPM (in the example of a stationary bicycle), it can also display information provided by, for example, the trainer via the system 250. The keyboard 296 is used to input various user commands into the system.

Preferably, each exercise device is provided with a device ID 292. This identifies the particular device to the system 250. In one preferred embodiment, the device ID is stored in an EPROM internal to the interface controller 282. In other embodiments of the present invention, the device ID can be provided by dip switches or other coding mechanisms that can be read by the interface controller 282.

Also preferably, each user is provided with a user ID 294. This permits a user to use any piece of compatible equipment by entering his or her user ID, such that the system 250 knows that he or she is using that exercise device. The user ID can be provided through the keyboard 296, or can be provided in the form of a physical key that can attach, for example, to a keychain. Magnetic keys which can store a user ID 294 are well known to those skilled in the art.

Communications between the interface controller and the rest of the system 250 through the transmitter 286 and the optional receiver 302 comprise "in-band" communication. However, there can also be out-of-band communication signals 304 between the controller 280 and, for example, a local server 266A. These "out-of-band" signals can include, for example, high speed data communication to provide real time video (e.g. streaming video over the Internet) on the display 298.

FIG. 15 is a block diagram of an exemplary interface controller 282 of this invention. The interface controller 282 preferably includes a system bus 306 which interconnects a number of components such as a microprocessor 308, an EPROM 310, RAM 312, and a number of interfaces 314-322. Optionally, the interface controller 282 can include a system ID interface 324 and a clock/counter 326, both of which would also be coupled to bus 306.

In certain embodiments, it is preferable that as many as the components of controller 282 as is possible are integrated into a single device. For example, the microprocessor, RAM, and EPROM, as well as a number of the I/O devices, can be integrated into a single chip. The EPROM can be EEPROM which allows the electrical reprogramming of the EPROM. Alternatively, the controller 282 can be made from discrete devices.

The EPROM 310 includes the program instructions for the controller 282. These program instructions will be described in greater detail with reference to FIGS. 16, 17, 18 and 19. Also, preferably, this system or device ID can be stored in the EPROM 310 during factory installation. The RAM 312 is used as "scratch pad" memory by the microprocessor and can serve as a buffer for the various I/O devices. The EPROM 310 and the RAM 312 comprise the primary memory for the controller 282 which may have a memory map as indicated at 328. In this exemplary illustration, interface programming, encryption algorithms, system ID, and scripts are mapped into memory locations ranging from low (LO) memory to high (HI) memory.

The various input/output (I/O) devices include a user ID interface 314, a sensor interface 316, an actuator interface 318, a keyboard interface 320, and a display interface 322. The primary direction of data flow is indicated by the arrow to each of these I/O devices. That is, the user ID interface provides user ID information to the system 282, and is therefore primarily an input device. Likewise, sensor interface 316 and the keyboard interface 320 primarily provide

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information to the system 282 and therefore are also input devices. The actuator interface 318 and the display interface 322 "display" will provide outputs from the controller 282 and, therefore, are primarily output devices. As will be appreciated by those skilled in the art, input devices include analog-to-digital circuitry (A/D), while output devices include digital-to-analog (D/A) circuitry.

As noted above, a preferred embodiment of the invention stores the system ID in the EPROM 312. However, it may also be desirable to have a system ID provided externally to the controller 282 via system or device ID interface 324. This would more securely couple the device ID to the physical device, such that the controller 282 or EPROM could not be removed and placed on another exercise device. Also shown is an optional clock and counter, which in a certain embodiments is a real time clock. The clock/counter 326 is used to time various intervals, such as sleep mode, pulling schedules, etc.

FIG. 16 illustrates part of the interface programming stored in the EPROM 310 of FIG. 15. More particularly, a process 329 is implemented on the controller 282 which begins at 330 and, in an operation 332, the process initializes the hardware. As will be appreciated by those skilled in the art, this involves the writing to certain registers and the initialization of counters and other variables in the controller 282. Next, in an operation 334, it is determined whether the hardware is operating correctly. This is typically accomplished under microprocessor 308 control wherein data is written to and read from memory and various buffers, and wherein commands are sent to the various I/O devices to see if they operate correctly. If the hardware check is not okay, an error is displayed in operation 336, preferably on the display 298 of the exercise device controller 280. The process then ends at 338. However, if the hardware is determined to be functional, an operation 340 reads the system ID. Next, in operation 342, the controller 282 of an exercise device, for example 264A, attempts to connect with a local server, such as server 266A. If it does not successfully connect with the server, a "local mode" flag is set to indicate that there is no server connection. If the controller 282 does connect with the server, an operation 246 determines whether the server is on the Internet. If the server (such as a server 266A or 272A) is not connected to the Internet, an operation 348 sets the server mode flag to indicate the server is not on the Internet. If operation 346 determines that the server is on the Internet, an operation 350 sets an Internet mode flag.

Next, an operation 352 determines if there is a user ID. The invention can work in either an user identified mode, or in an unanimous mode. If there is no user ID as determined by operation 352, an operation 354 sets an anonymous mode flag. If there is a user ID, an operation 356 reads the user ID for use by the system. Finally, the exercise session is run in an operation 358 and the process ends at 338.

In FIG. 17, the process "Connect with Server?" 342 of FIG. 16 is illustrated in greater detail. Process 342 begins at 360 and, in operation 362, the start time is obtained and stored. Next, in operation 364, it is determined whether a "ping" is received from the server. By "ping" it is meant that a message is sent from the server and addressed to the exercise device having the primary purpose of determining whether the exercise device is active or "alive." If operation 364 does not receive a ping from the server, the current time is obtained in operation 366 from, for example, the real time clock 226, and an operation determines whether the difference between the current time and the start time is greater than a constant K. If it is, the process 342 has "timed out" and the operation is complete at 370.

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If a ping has been received from the server as determined by operation **364**, an operation **372** performs a key exchange with the server. As will be appreciated by those skilled in the art, this key exchange should be secure using one of several well known key exchange algorithms. For example, the well-known Diffie-Hellman algorithm is suitable. In one embodiment, the server can encrypt its key with a first encryption code, send it to the exercise device which then adds its own key and encrypts the entire package with its own encryption. The doubly encrypted packet is then sent back to the server which decrypts with its encryption code, removing its own key and encrypting the encrypted packet including the key of the exercise device. The encrypted packet is then sent back to the exercise device to remove its encryption and, finally, the encrypted packet is then sent back to the server where it is decrypted by the server to remove the exercise devices key. Thus, by using multiple transmissions, the keys can be securely exchanged without broadcasting any unencrypted data.

Process **342** continues at operation **374** where it is determined whether the key exchange was successful. If it was successful, a connect flag is set to true in an operation **376** and the process **342** is completed at **370**. Otherwise, the connection flag is set to false in operation **378**, and the process is likewise completed.

In FIG. **18**, the process "run exercise session" **358** of FIG. **16** is illustrated in greater detail. The operation **358** begins at **380** and, in an operation **382**, a default script is loaded. Next, in an operation **384**, it is determined whether there is a script change command. These script change commands are preferably (but not necessarily) of at least three different types. A first type of script change command is a user script change command which is implemented in an operation **386**. A second type of script change command is a server script change command which is implemented in an operation **388**. A third type of script change command is an Internet script change command which is implemented in an operation **390**.

After the implementation of one of the script change commands in operations **386**, **388**, or **390**, or in the absence of a script change command, an operation **392** executes the script on the exercise device for an interval of time. An operation **394** determines whether the process is done, and, if not, process control is returned to operation **384** to look for additional script change commands. Otherwise, the process is completed at **396**.

As used herein, a "script" is a sequence of data or commands which can be used to influence the operation of the exercise equipment. Therefore, a script can be a computer program, such as a Java Applet, or it can be a proprietary script language which is interpreted by the controller of the exercise equipment, or it can be a string of data or parameters, (e.g., duration, level, scaling, etc.), that is acted upon by the controller to influence the operation or use of the exercise device. It will therefore be appreciated that the term "script" broadly encompasses the locally executed functionality in the exercise equipment controller to influence the operation of the exercise device. Of course, as will be appreciated by those skilled in the art, portions of the "script" can be distributed, for example, to the local server or, via the Internet, to one or more systems, sensors, or machines connected to the Internet.

FIG. **19** is a flow diagram illustrating the "executed script" operation **392** of FIG. **18** in greater detail. Operation **392** begins at **398** and, in an operation **400**, the script is read according to a time interval Δt . In an operation **402**, any actuator is sent its command, and in an operation **404**, any sensor data is read. As will be appreciated by those skilled

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in the art, an actuator command is typically accomplished by placing data in an output buffer of the actuator interface which is then converted by D/A converters to analog signals which can control the actuator. As will also be appreciated by those skilled in the art, the reading of sensor data is typically accomplished by reading a sensor data buffer in the sensor interface which was produced by taking analog signals produced by the sensor and digitizing them with a A/D converter. The sensor and parameter data are stored in an operation **406** for later reference and processing. This data can typically be stored in buffers provided in the RAM Memory **312**.

Next, an operation **408** determines whether there is an Internet mode flag or a server mode flag. If so, the sensor data is buffered in operation **410**. An operation **412** then determines whether there is a call from the server and, if so, the sensor buffer is sent to the server in an operation **414**. If there is no Internet mode flag or server mode flag or after the completion of operations **412** and **414**, an operation **416** determines whether it is time to create an update. If so, an operation **418** updates the session parameters and the display. That is to say, the session parameters are updated in a memory store, such as RAM **312**, and a display is provided such as on display **322**. Process control then returns to operation **400**. The process **392** continues to operate until an interval of time has elapsed at which time operation **392** ceases and operation **394** on FIG. **18** takes process control.

In FIG. **20**, a fixed local server **266A** is graphically illustrated. In this embodiment, the server **266A** sits on a floor **420** between an electrical outlet **422** and a telephone outlet **424**, both of which are provided in a portion of a wall **426**. In this embodiment, the server **266A** is provided with an external power supply **428**, which also sits on the floor **420**. The supply power **428** has a cord **430** which plugs into one of the sockets of electrical outlet **422** and has another cord **432** to provide DC power to the server **266A**.

The server **266A** is preferably provided with an antenna **432**, a reset button **434**, a number of exercise device connection sockets **436**, and an Internet connection socket **438**. In a preferred embodiment of the invention, the server **266A** communicates with the exercise devices wirelessly through radio transmission emanating from antenna **432**, for example. In a wireless system, the transmitter **286** and receiver **302** of controller **280** in FIG. **14** are radio frequency transmitters and receivers. Alternatively, the server can communicate with the exercise devices by other wireless communication forms, such as infrared communication. Still further, the server can communicate with the exercise devices via a hard wire, coaxial cable, fiber optic cable, etc., connection through one of the exercise device connection sockets **436**. Likewise, while the server **266A** is shown to be coupled to the telephone outlet **424** by a telephone cable **440**, the server **266A** could also make an Internet connection through wireless devices, such as a radio modem. Further, while the outlet **424** is described as a "telephone" outlet, it will be appreciated that it also represents other hard wire and/or wireless connections to the Internet including DSL, T1 lines, fractional T1 lines, etc. That is, the telephone outlet **424** represents either an analog or digital signal connection between the outlet and the Internet which could actually be implemented by a number of different protocols.

In certain embodiments of the present invention, the human-computer interface of the local server is kept as simple as possible. For example, one embodiment of the invention the server has only a reset button as an interface. This makes the server "appliance-like" and therefore very easy to use. In other embodiments of the present invention,

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more complex human-computer interfaces such as a touch-screen display providing a menu of options can be provided. The wireless embodiments of the present invention also help in the appliance-like nature of the local system, as well as its scalability. For example, a new exercise device can be added to a local system by simply bringing it into proximity to the local server and hitting the reset button of the local server, and an exercise device can be removed from the local system in a similarly easy fashion. One exercise device or many exercise devices can be associated with a local server in a very scalable manner. Further, many local servers, trainer machines, and remote servers can be added to the system in a scalable fashion.

In FIG. 21, the server 226A includes a typical computer architecture including a bus 442 to which is a coupled a microprocessor 444, random access memory (RAM) 446, read only memory (ROM) 448, as well as a number of peripherals 434, 450 and 452. The microprocessor 444, RAM 446, and ROM 448 are relatively center components and they are available from a variety of manufacturers. However, it is preferable to have the microprocessor 444 be an Intel compatible Pentium class processor so that it can run standard operating instrument systems such as the Linux operating system. Preferably, a journaling file system such as Reiser FS would be used so that the integrity of the file system would be preserved in the event of a sudden power failure. For simplicity, the RAM 446 should be static RAM (SRAM) and the ROM 448, depending on the implementation, may be an EPROM.

The reset button 34 is coupled to the bus 442 by appropriate interface circuitry such that a reset command can be sent to the microprocessor 444. An in-band transceiver 450 is coupled to the bus 442 to send and receive electromagnetic radiation (radio signals) via the antenna 432. The in-band transceiver 450 communicates with the in-band transmitter 286 and the in-band receiver 302 of 614. The network connection 452 couples the bus to the Internet socket 438. Depending on the type of Internet connection, the network connection 452 may take a variety of forms. For example, the network connection 452 can be a modem and the Internet connection is by regular telephone line. Alternatively, the network connection can be an Ethernet connection for connection to a digital line such as a DSL or T1 line. As is well known by those skilled in the art, the network connection is configured for the appropriate connection type.

In an expanded version of the server 226A, there is also provided a mass storage device such as a hard disk drive 454, a graphics accelerator 456, and an out-of-band transceiver 458. The addition of an hard disk drive is desirable and then it supports standard operating systems such as the Linux operating systems. Of course, other operating systems could be supported such as Windows NT, Unix, etc. However, the Linux operating system is particularly well suited for this application since it is inexpensive (free), easily configurable, and well suited for Internet connection applications. The hard disk drive can also serve as a local store for scripts, programs, commands, buffered items, graphics, video and audio informations, etc. The graphics accelerator 456 is useful for graphically driven outputs which, in a preferred embodiment, would be sent to a user by an out-of-band transceiver 458. For example, the user could use a wireless, headmounted display with display screens in front of each of his or her eyes as well as ear phones. This type of information is of too high of a bandwidth for the preferred, low bandwidth in-band transceiver 450, but could be handled by an out-of-band transceiver 458

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transmitting on an antenna 460. By providing this form of out-of-band communication, high quality and stereo video information could be sent to a user, as well as high fidelity and stereo audio information. This information can be viewed on a television screen, a computer monitor, a head-mounted display, a display associated with the exercise device, etc., by way of the out-of-band transceiver. While the out-of-band transceiver is shown to be wireless in this embodiment, it will be appreciated by those skilled in the art that the out-of-band transceiver can also be a wired transceiver such that connection media such as electrical wire, coaxial cable, fiber optic, etc., can be used. Further, other forms of wireless transmission and reception can be used with the out-of-band transceiver 458 as well, including, but not limited to, I/R transmission and/or reception. Of course, all communication can be "in band" if the investment is made in the hardware necessary to support high-bandwidth communication. For example, the exercise equipment controller can include sufficient processing and peripheral power to utilize 802.11 wireless interconnections, which would provide enough bandwidth for completely "in-band" communications in certain embodiments of the invention.

FIG. 22 illustrates the server operating system 462 which is implemented on the server 226A. The operating system begins at 464 with power on and, in an operation 466, the operating system is booted. As mentioned previously, a preferred operating system is Linux, which is a public domain operating system. Preferably, the Linux is provided with Reiser FS to prevent power up and power down glitches. The booting of an operating system, including Linux with Reiser FS, is well known to those skilled in the art. Next, in an operation 468, one or more daemons are executed. In this example, two daemons are run including Cybergym Daemon A and Cybergym Daemon B. As well known to those skilled in the art, a daemon is a process which runs substantially without interaction with the end user. An operation 470 determines whether there has been a reset based upon the pressing of a reset button 434 of FIG. 20 and, if so, the entire system is reset by turning over operational control to operation 466. If there is no reset command, the Cybergym daemon continue to operate.

In FIG. 23, the running of Cybergym Daemon A as part of process 468 is illustrated in greater detail. The process 468 begins at 472 and, in an operation 474, the roster is fetched. As used herein, a "roster" is a list or the like of all exercise devices that are "known" to this server. That is, a server only communicates with a known list or "roster" of exercise devices, aka "client machines." Next, the server performs a roll call of the exercise devices on its roster in an operation 476. If a exercise device which is on the roster does not respond despite repeated attempts, it is eventually removed from the roster. If the exercise device does respond, it is told to go to sleep, and is checked off on the roster that it met the roll call. Next, in an operation 478, there is a broadcast greeting to new Cybergym™ machines, i.e., to new exercise devices which may have been brought within connection range to the server. If a new Cybergym machine is detected in an operation 480, it is added to the roster and the broadcast greeting is again sent until the operation 480 does not attack any new exercise devices. At that point, the Cybergym sessions begin to execute with operation 484.

FIG. 24 is a slow diagram illustrating the "Run Cybergym Sessions" process 484 of FIG. 23 in greater detail. Process 484 begins at 486 and, in an operation 488, the roster is again fetched. A counter D is initialized to 1 and in operation 490 and then exercise device number D is called. If exercise device (D) responds as determined by an operation 494, the

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response is processed in an operation 496 and process controller is returned to operation 492. If there is no response from the exercise device (D), it is determined whether all of the devices in the roster has been called in operation 498. That is, the variable D is compared to the value NDEV and, if it is less than or equal to NDEV (the number of devices in the roster), the variable D is increased by 1 in an operation 500 and operation control is return to 492. If the entire list has been called, operation control is returned to 488 to fetch the current roster.

FIG. 25 illustrates the “process response” operation 496 of FIG. 24 in greater detail. More particularly, process 496 begins at 502 and, in an operation 504, the communication type is determined. If it is a key exchange communication type, an operation 506 performs a secure key exchange by one of a variety of methods, as was explained previously. The process is then completed at 508. However, if the communication type as determined by operation 504 is transmit, an operation 510 determines whether there is data available for this device. This is typically determined by looking in a lookup table associated with a buffer. If there isn't any data available, then the process is completed at 508. Otherwise, the data is encrypted and transmitted to the device in an operation 512. Once the data has been transmitted to the device and, preferably, the device is indicated that the data has been received and decrypted properly, the buffer is cleared for that device in an operation 514 and the operation is completed at 508. If the communication type is “receive”, an operation 516 receives encrypted data from the exercise device. Next, the encrypted data is decrypted, preprocessed, and buffered as appropriate. The process is then completed at 508.

FIG. 25A illustrates an exemplary data packet sent in the transmit and receive operations that were discussed with reference to FIG. 25. In this instance, to send and receive packets are in the same format, although this is not necessarily the case in all embodiments of this invention. In this one exemplary illustration, the data packet 520 has a set of start bits which are typically a recognizable pattern for a receiving device. Next, the user key is transmitted in portion 524 of the packet, the developer's key is provided in the portion 526 of the packet, the server ID is provided in the portion 528 of the packet, and the communication type is provided in portion 530 of the packet. In this example, following the communication type is a portion 532 which contains data. This data portion can be a fixed length or a variable length as will be appreciated by those skilled in the art. Finally, an end portion 534 of the data packet 520 signals the end of the packet.

In FIG. 26, the “Run Cybergym Daemon B” process 468 is illustrated in greater detail. More particularly, process 468B begins at 536, and, in an operation 538, there is an attempted connection to the Cybergym server. If, in operation 540, it is determined that the connection to the server with the Internet was successful, process 468B will run in online mode. The process 468B will continue to run on the online mode 542 until the Cybergym server can no longer be accessed over the Internet, at which time process control will be turned over to operation 544 to run in an offline mode. This operation 544 is also evoked when the connection to the server is not successful as determined by operation 540. The process 468B will continue to run in the offline mode in operation 544 until an Internet connection to the server is again re-established, at which time operation control will be turned over to operation 542 to run in an online mode.

FIG. 27 is a flow diagram illustrating the “run online mode” process 542 of FIG. 26 in greater detail. The process

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542 begins at 546 and, in an operation 548, the system iterates over the exercise device buffers and collects data. That is, each of the exercise devices will have a buffer region for the storage of its data. Next, in an operation 550, the data is encrypted. There are, of course, many suitable encryption techniques, although public key encryption is preferred in general. Public key encryption technologies are well known to those skilled in the art and are available both commercially and in the public domain (example, PGP encryption technology). Next, in an operation 552, the data is transmitted to the Cybergym server via a socket connection. As is well known to those skilled in the art, a socket connection takes care of much of the housekeeping overhead in the transmission of data. For example, sockets typically take care of the buffering functions, etc., that implement and facilitate the transfer of data. Next, data is received from the Cybergym server via the socket. An operation 556 decrypts the data and distributes it to respective device buffers for later transmission to the devices via the process 596 as best seen in FIG. 25. Finally, an operation 558 determines whether the Cybergym server is still online. If it is, process control is returned to operation 548. If not, the process 542 is completed at 560.

FIG. 28 is a flow diagram illustrating the process “Run Offline Mode” 544 of FIG. 26 in greater detail. Process 544 begins at 562 and, in an operation 564, it is determined whether a connection to the Cybergym server has come online. If so, the process is completed at 566, such that the process 468B of FIG. 26 can run an online mode 542. Otherwise, the process 544 continues to run in the offline mode and, in an operation 568, the process iterates over the exercise devices and the buffer data. Next, in an operation 570, it process the buffers in local mode. Finally, in an operation 572, the process iterates over the exercise device and transmit data. Process control is then returned to operation 564.

As will be apparent to those skilled in the art, as it is used herein “iterate” means that the system is going through the roster device by device or buffer by buffer in an iterative fashion. That is, from a starting point, it first processes the device or buffer associated with that starting point, and then the point is iterated (typically by 1) to process the next device or buffer in the roster or other list. When the end of the roster or list is reached, it may be started again from the beginning in a circular fashion.

FIG. 29 is an illustration of a mobile local system. More particularly, the mobile local system has a mobile exercise device controller 270A and a mobile local server 272A, which may be coupled together in an either wired or not wired fashion. Still alternatively, the devices 270A and 272A can be coupled together by the frame of the bicycle 274 or otherwise. It is quite common for bicycles to be provided with bicycle “computers” which provide such indication as speed, RPM, altitude, etc. The mobile exercise controller 270A would take over this functionality as well as providing the functionality of the exercise device controller 280. The mobile local server 272A would have essentially the same functionality as the fixed server illustrated with reference to FIG. 21, except that it preferably is a more “stripped-down” version, not including the options of the hard disk, graphics accelerator, and out-of-band transceiver. Also, lower power consumption devices would typically be used, and the connection to the Internet is by radio modem from an included antenna.

The mobile system illustrated in FIG. 9 can be in two-way communication via, for example, a cellular telephone system 576. Alternatively, radio modem services such as formerly

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provided by Ricochet, would be another communication methodology. While the server 272A could conceivably service a number of control units 270A, it is likely to be dedicated solely to that control unit. This is because bicyclists may not always be in sufficient proximity for the units 270A to communicate with a single server 272A and, in fact, bicycles that are in close proximity may not want to share the same server 272A. Exceptions include such situations as group races or competitions, such as the Tour de France. In such an instance, a server 272A could be in a pace car, which would service a number of controllers associated with individual bicycles.

The server 272A is also preferably included with a variety of sensor inputs, including GPS from multiple satellites 578, altimeter readings based on, for example, atmospheric pressure or, alternatively calculated from GPS information, inclinometers, etc. In this fashion, a mobile exercise device user can interact with a remote server, a trainer, or compete against other mobile and/or fixed exercise devices. For example, a user can be riding the bicycle while data such as distance, speed, RPM, elevation gain, etc., are transmitted to the remote server and provided to the trainer. The trainer can then download scripts or programs to the unit 270A indicating that a user should pick up the pace, shift to a lower gear, etc. Furthermore, out-of-band communications can also occur with the trainer, for example, by cellular telephone connection. The mobile exercisers can also compete and interact with fixed exercisers, again with some scaling and/or handicapping.

FIG. 30 is an illustration of yet another form of mobile local system 256B. More particularly, sensors and transmitters can be provided in the shoes 580 of a runner 582 which communicate with a mobile local server 272B attached to the belt 584 of the runner 582. For reasons similar to those discussed before, it is preferable that there be a one-to-one correspondence between the mobile units 270B and the mobile local server 272B. As was the case discussed with reference to FIG. 29, the mobile local server 272B can communicate with the Internet via a variety of channels, including radio modem channels, cellular phone channels, etc. The local mobile server 272B also preferably has multiple sensing modes, including GPS. Similar sensors can be provided for other sports and activities such as weight lifting, swimming, etc.

As indicated above, the mobile interactive local systems allow a user (athlete) to at least upload data via the Internet and, preferably, download information. While the "in-band" bandwidth may be somewhat limited in certain embodiments, it can be augmented without a band communications as well. In addition to allowing the recording of exercise parameters on the Cybergym server and interacting with a Cybergym trainer, the mobile exercise devices permit competitions, even against different classes of exercise devices. For example, with a suitable handicap, a runner can race against a cyclist who may be competing with someone on a stationary rowing machine. This also permits amateurs (presumably on fixed exercise devices) to compete with professionals on mobile exercise devices. Furthermore, "virtual worlds" can be created with which one or more users can interact. In one scenario, each user can be represented by a spaceship which can "fly" through space, have dogfights, etc. based upon the use of the exercise devices and optional in-band or out of band controllers.

FIG. 31 illustrates a possible screen that can be displayed on the personal computer system 262A of a trainer 276A. As described previously, in a preferred embodiment of the present invention, the computational functionality with

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respect to the trainer machine 264A is provided by the Cybergym server 258. Therefore, the trainer 276A needs only to install a network browser on his trainer machine 262A to enjoy full functionality of the system 250. In this instance, the trainer 276A point to his browser to a URL 588, namely <https://www.trainer.Cybergym.net>. This brought up the display allowing the trainer to choose from a number of options. For example, the trainer can choose option: 1) coach online clients; 2) coach offline clients; 3) manage his or her coaching business; and, 4) communicate with Cybergym management. As is well known to those skilled in the art, the trainer 276A can select one of these options with a pointer 590 controlled by a pointing device such as a mouse or trackball. The trainer 276A then "clicks" on the pointer 590 by depressing the button on the mouse or trackball to select the appropriate next screen. It should be noted that these communications are all secured and encrypted, and are run over an <https://connection>.

FIG. 32 illustrates a screen 592 which can be accessed by selecting the "Coach Online Clients" option from the list on screen 586. This is again a secure connection and it indicates all of the users in the group belonging to trainer 276A that are currently online. If the user has a exercise device provided with a video camera, the image of the user is displayed on the screen as shown. If the user is not working with an exercise device equipped with a video camera, and "A" is provided in place of his or her image to indicate that they are riding anonymously, at least in the visual sense. Preferably, the trainer 276A also has a trainer machine 262A that is provided with a video camera which would allow his or her image to be displayed at the exercise device, as long as it was provided with sufficient out-of-band devices. Of course, as the capability of in-band transmission increases, this information may also be transmitted to the user via an in-band connection, as described above.

FIG. 33 illustrates a screen 594 which was accessed by selecting the user Jane Doe at 593. This provides a full screen of information specifically about the user Jane Doe. The screen 594 can include a video portion 596, basic information 598 about the user, information 600 concerning her exercise program, a variety of graphs and charts 602, 604, and 606 illustrating various parameters of her exercise history, and a comments field 610. The screen 594 also preferably displays a display of the current script 612 running on the device while allowing the trainer to modify it and submit it back to the device by means of a on-screen button 614. Similarly, the screen 594 also preferably includes a program window 616 which allows the trainer to view and modify the overall program for the user Jane Doe and to submit it by the on-screen button 618 to the user exercise device. An on-screen button 620 permits the trainer's camera to be toggled on and off and an on-screen button 622 permits a microphone to be switched on and off so that the trainer can either talk or not be heard by the user.

In FIG. 34, a Cybergym™ server 260A is described in greater detail. As will be appreciated by those skilled in the art, a server 260A includes a hardware component and a software component. The hardware component (not show) is typically a personal computer, workstation, network server, etc. Sometimes it is implemented as a "virtual machine" wherein a number of logical machines are implemented on a single hardware machine. The software component 624 provides the functionality of the Cybergym system.

Software component 624 is based upon a database 626 which is used to store and retrieve information, programs (scripts), graphics, video, telemetry, and other data used in performance of the Cybergym system. This database is

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preferably provided as a relational database, such as is provided by Oracle Corporation of Redwood Shores, Calif.

Communicating with the database 626 are daemons 628 and servlets 630. The purpose of the daemons is to service the local servers, such as servers 254A, 254N and 256A, at least partially through the Internet, or other Wide Area Network (WAN). The purpose of the servlets is to service the trainer machines, such as trainer machines 262A and 262N, as well as any personal computer or "workstation" 632 used by a user. As is well known to those skilled in the art, servlets are often used to provide web-based interfaces to database driven web sites.

FIG. 35 illustrates the daemon 628 of FIG. 34 in greater detail. Daemon 628 begins at 634 and, in an operation 636, establishes a connection to the database 626. Next, in an operation 640, it determines whether there is a new connection with a local server. If so, an operation 642 opens a socket to communicate with a local server (such as local server 266A or 272A), and starts a new "thread." As is well known to those skilled in the art, a "thread" is a new process which operates asynchronously from its parent process (i.e. daemon 628). Next, in an operation 644, the socket connection made by operation 642 is processed. Process control then returns to operation 640.

If operation 640 does not detect a new connection, then the daemon is put to "sleep" for a period of time k seconds, e.g. k=1-5 seconds. After the period of time has elapsed, an operation 650 determines if there is a system shutdown. If so, the operation of the daemon 628 ends at 652. Otherwise, process control is again returned to operation 640.

FIG. 36 illustrates the process "Process Socket Connection" 644 of FIG. 35 in greater detail. Process 644 begins at 654 and, in an operation 656, the user ID(s) and system ID(s) are obtained from the socket that was created by operation 642. Next, in an operation 658, the data base is accessed to obtain any scripts or other data or programs that are to be sent to the local servers. Operation 660 determines if there are any scripts available and, if so, they are transmitted to the local server via the socket in an operation 662. If there is telemetry or other data communication available from the socket as determined by an operation 664, the telemetry and/or other data communication is read from the socket in an operation 666 and is written to the database in an operation 668. An operation 670 then determines whether the connection has been lost, at which time the process is terminated at 672. Otherwise, process control is returned to operation 658 to continue the processing.

FIG. 37 is a flow diagram illustrating the servlet process 630 in greater detail. The servlet 630 begins at 674 and, in an operation 676 it is determined if there is a "connection" from the web. By "connection" it is meant that a connection or "request" has been sent from an Internet enabled machine to the server 260A. Upon the receipt of the request from, for example, a trainer at a trainer machine 262A or a user at a personal computer 632, the operation will recognize the desired connection and, in an operation 678, will start a new thread, next, in an operation 680 the connection is processed, and the servlet will have completed its process at 682. If a connection from the web is not recognized by operation 676, an operation will determine if there has been a system shutdown. If so, the servlet is again completed at 682. Otherwise, process control is returned to operation 676 to again look for a connection from the web.

FIG. 38 illustrates the process "Process Connection" 680 of FIG. 37 in greater detail. The process 580 begins at 686 and, in an operation 688, parameters are received from the request that came with the connection. Next, the parameters

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are processed in an operation 690. For example, if the trainer or user specified a request for information concerning a specific exercise session, it might be necessary to transform the name of the person received in the request into a user ID. Next, in an operation 692, the data, program, graphic, video, etc. ("information") required to fulfill the request is read from the database 692. Next, the information is processed in an operation 694. An operation 696 determines whether the database should be updated, based on the request type. For example, some requests merely interrogate the database for information, while others require the storage of information in the database. If the database is to be updated, an operation 698 writes to the database and the process 680 ends at 700. Otherwise, an operation 702 transmits the reply back to the requester, and the process again ends at 700.

It will therefore be appreciated that in a preferred embodiment of the present invention, a distributed wide area network (WAN) such as the Internet is used to couple local servers, remote servers and workstations together. Users at local systems can interact visually and even in a tactile manner with other users over the Internet. For example, a first user at a first local station can take a "virtual ride" with another user at a second local station through the Internet connection. Likewise, a remote "personal trainer" can interact with a user at a local station via the Internet communication linkage. The present invention therefore allow group exercise experiences, even when a user is physically alone.

While this invention has been described in terms of several preferred embodiments, it is contemplated that alternatives, modifications, permutations and equivalents thereof will become apparent to those skilled in the art upon a reading of the specification and study of the drawings. It is therefore intended that the following appended claims be interpreted as including all such alternatives, modifications, permutations and equivalents as fall within the true spirit and scope of the present invention.

What is claimed is:

1. An exercise system comprising:

a local system including at least one exercise apparatus and at least one associated local server, said at least one local server monitoring the operation of said at least one exercise apparatus, said exercise apparatus and said local server having an in-band communication using a bid-directional wireless protocol;

an out-of-band communication with a user of said at least one exercise apparatus, wherein said out-of-band communication has a relationship to said in-band communication;

a remote server; and

wherein said local server and said remote server include communication interfaces which permits communication over a packet network connection that at least part-time couples said local server to said remote server for data communication between said local server and said remote server, such that said remote system may receive local system data from said local server concerning said operation of said exercise apparatus, and such that said local system may receive remote server data from said remote server providing feedback concerning said operation of said exercise apparatus.

2. An exercise system as recited in claim 1 wherein said local system is one of a plurality of local systems, each of which is in at least part-time communication with said remote server, and wherein said packet network operates on a TCP/IP protocol.

3. An exercise system as recited in claim 2 further comprising a workstation that is in at least part-time communication with said remote server.

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4. An exercise system as recited in claim 3 wherein said workstation is a trainer machine.

5. An exercise system comprising:

at least one exercise apparatus having an in-band bi-directional wireless communication device;

an out-of-band communication device capable of a communication with a user of said at least one exercise apparatus that has a relationship to said in-band communication;

at least one associated local server having a bi-directional wireless communication device such that said exercise apparatus and said local server may communicate with each other via a wireless connection; and

at least one remote server in communication with said local server via, at least in part, an Internet connection, said remote server at least temporarily storing information concerning exercise sessions performed on said exercise apparatus.

6. An exercise system as recited in claim 5, further comprising scripts sent from said local server to said exercise apparatus via said wireless connection.

7. An exercise system as recited in claim 6 wherein said scripts were sent from said remote server to said local server.

8. An exercise system as recited in claim 5 wherein a protocol for said wireless connection is for the local server to iteratively poll said exercise apparatus for communications from said exercise apparatus.

9. An exercise system as recited in claim 5 wherein a protocol for said wireless connection includes a roster of known exercise apparatus.

10. An exercise system as recited in claim 9 wherein wherein a protocol for wireless connection adds new exercise equipment which can newly communicate with said local server to said roster, and removes exercise equipment which is no longer in communication server from said roster.

11. A method for controlling an exercise device comprising:

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running a program on a controller to affect the operation of an exercise device; and

wirelessly communicating with a local server to provide said local server with at least an exercise device ID which may be used to identify communications with said exercise device.

12. A method for controlling an exercise device as recited in claim 11 wherein the communication between said local server and said controller is encrypted.

13. A method for controlling an exercise device as recited in claim 11 wherein the communication between said local server and said controller is an in-band communication, and further comprising communicating with an out-of-band communication with a user of said exercise device.

14. A method for controlling an exercise device as recited in claim 11 wherein said communication is by radio-frequency packets.

15. A method for controlling an exercise device as recited in claim 11 further comprising:

communicating between said local server and a remote server via, at least in part, the Internet.

16. A method for controlling an exercise device as recited in claim 15 wherein said remote server is database driven.

17. A method for controlling an exercise device as recited in claim 16 wherein said database is a relational database.

18. A method for controlling an exercise device as recited in claim 17 wherein said remote server communicates with said local server via a daemon.

19. A method for controlling an exercise device as recited in claim 15 further comprising at least one machine coupled to the Internet for communicating with said remote server via an Internet browser.

20. A method for controlling an exercise device as recited in claim 19 wherein said machine is one of a trainer machine and a user machine, and wherein said remote server communicates with said machine with a servlet running on said remote server.

* * * * *

CERTIFICATE OF SERVICE

I, R. Parrish Freeman, counsel for appellant Icon Health & Fitness, Inc., hereby certify that on this 3rd day of February, 2016, the foregoing **COMBINED BRIEF AND APPENDIX OF APPELLANT ICON HEALTH & FITNESS, INC.** was filed electronically with the U.S. Court of Appeals for the Federal Circuit by means of the Court's CM/ECF system. I further certify that the foregoing was served on the following counsel of record, by means of electronic mail:

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CERTIFICATE OF COMPLIANCE

1. This brief complies with the type-volume limitation of Federal Rule of Appellate Procedure 32(a)(7)(B) because the brief contains 1,697 words, excluding those parts of the brief that are exempted by Federal Rule of Appellate Procedure 32(a)(7)(B)(iii).

2. This brief complies with the typeface requirements of Federal Rule of Appellate Procedure 32(a)(5) and the type style requirements of Federal Rule of Appellate Procedure 32(a)(6) because this brief has been prepared in proportionally spaced typeface using Microsoft Word in 14-point Book Antiqua font.

DATED: February 3, 2016

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